World IT Sales Rise 4.1% To $290 Billion *page 12*

A CAHNERS PUBLICATION

DATAMATION

FOR CORPORATE COMPUTING PROFESSIONALS WORLDWIDE

JUNE 15, 1992

THE DATAMATION 100

Our Annual Ranking Of The Top 100 Suppliers Worldwide *page 13*

The Top 100 Firms In North America page 16

Strategies Of The North American Firms *page 37*

Global Leaders In Nine Product Categories page 26

A Five-Year Growth Comparison *page 26*

EXCLUSIVE
INTERVIEW WITH
IBM's
Jack Kuehler
page 34

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June 15, 1992 CONTENTS Vol. 38, No. 13

DATAMATION

FOR CORPORATE COMPUTING PROFESSIONALS WORLDWIDE

ABOUT THE COVER:
How'd they do that? See page 5.

FEATURES

OVERVIEW

12 World IT Sales Stagger 4.1% To $290 Billion

North American sales limp 2.9% to $190 billion as the computer industry matures.

	Page
The DATAMATION 100	13
The DATAMATION North American 100	16
Global Leaders In Nine Product Categories	26
The North American Top 25 By Product Category	30

EXCLUSIVE INTERVIEW

34 IBM's Kuehler: We're Going To Be Different

The president of IBM discusses industry trends, Big Blue's reorganization, SAA and the PC business.

NORTH AMERICAN PROFILES

Adobe	156
ADP	64
Amdahl	67
American Express	90
American Management	149
Andersen Consulting	52
Apple	43
ASK Computer	137
AST Research	99
AT&T	42
Autodesk	150
Bell Atlantic	121
Boeing	147
Bolt Beranek & Newman	163
Borland	126
Cabletron	152
Cadence	142
Commodore	87
Compaq	46
CompuAdd	125
Computer Associates	76
Computer Task Group	149
Concurrent	154
Conner Peripherals	70
Control Data	83
Coopers & Lybrand	119
Cray	95
CSC	58
D & B Software	121
Data General	80
Datapoint	152
Dell	92
Diebold	141
Digital	38
EDS	44
Ernst & Young	120
Everex	126
FiServ	151
Gateway 2000	109
General Electric	95
Genicom	164
Gerber Scientific	152
Hewlett-Packard	39
IBM	37
Information Builders	164
Intel	84
Intergraph	83
Kodak	138
Legent	163
Lockheed	125
Lotus	96
MAI Systems	147
Martin Marietta	120
Maxtor	91
Mentor	134
Micropolis	142
Microsoft	52
Motorola	90
National Data	159
Northern Telecom	75
Novell	103
NYNEX	119
Oracle	85
Packard Bell	103
PRC	110
Policy Management	145
Price Waterhouse	100
Prime	77
Pyramid	159
Quantum	86
Reynolds & Reynolds	155
SAS Institute	148
Science Applications	106
Seagate	49
Sequent	160
Shared Medical	134
SHL	113
Silicon Graphics	109
Sterling	156
StorageTek	70
Stratus	133
Sun	45
SynOptics	153
Systematics	138
Tandem	61
Tandon	130
Tandy	86
Tektronix	150
Teradata	148
Texas Instruments	99
3Com	141
3M	91
TRW	55
Unisys	42
Wang	58
Western Digital	130
WordPerfect	122
Wyse	129
Xerox	46
Zeos	155

DEPARTMENTS

Inside 9
Careers 166
Ad Index........................171

CONTENTS

About The Cover

Artist Bill Foss works wonders with graphics.

When we have our annual meeting to discuss cover concepts for the DATAMATION 100 issue, we don't always agree on the exact form it should take, but we do always agree on the function—a clear and resounding image.

This year, we've borrowed from the technology we quantify in these pages to create a cover image that, we believe, has no equal. With the help of Silicon Graphics Inc. (No. 74 on the DATAMATION 100) and artist Bill Foss, we have brought to life our concept using some of the same Silicon Graphics technology that created the alien in the smash hit movie *Terminator 2: Judgment Day*.

Working on an Iris Indigo workstation, Foss first created a spherical model using Wavefront Technology Inc.'s Advanced Visualizer software—a 3-D modeling, animation and rendering package. To make it appear three dimensional, he then wrapped around the sphere a texture map image of the Earth. That image was made by compiling hundreds of satellite images on Silicon Graphics workstations to create one Earth image. It was provided by courtesy of Tom Van Sant and The Geosphere Project*. Originally, the Earth was turned to feature Europe, but when we suggested showing North America instead, Foss was able to make the change in minutes.

The number 100 was then digitized, extruded to appear three dimensional and then curved around the globe. Reflections of the land and sea from the Earth were then colored to show depth.

Finally, our special effect "whoosh" was added across the 100 and around the orbit of the Earth, using Wavefront's Video Composer, a special effects and image compositing product that layers multiple images seamlessly to give the impression of movement.

Surprisingly, the project took Foss less than six hours. Modeling took about two hours; putting the whole scene together about three hours; and final special effects took 23 minutes. Foss credits his swiftness to the relative ease of use and speed of the software, noting that it is in the forefront of technology for both video and film. The final product is a high-resolution image (4,096 dots per inch) requiring a 13-megabyte uncompressed file.

Not quite *Sports Illustrated's* hologram of Michael Jordan, but there's always next year.

*** Satellite map image provided by courtesy of Tom Van Sant and The Geosphere Project, with assistance from NOAA, NASA, and Eyes on Earth. Technical direction by Lloyd Van Warren. Source data derived from NOAA-TIROS-N series satellites. Completed April 15, 1990. All rights reserved by Tom Van Sant Inc., 146 Entrada Dr., Santa Monica, CA. 90402, (800)-845-1522. © Tom Van Sant/The Geosphere Project.**

About The Numbers

All figures used in the DATAMATION 100 are for calendar year 1991. For those companies operating on a fiscal year that doesn't coincide with the calendar year, DATAMATION either compiles quarterly information or relies on the estimates provided by the companies themselves or by industry analysts. DATAMATION also allows companies to restate the previous year's figures. We do not include revenue from basic data transmission services, stand-alone typewriters or cash registers, instrumentation, semiconductors, printed circuit boards, automatic test equipment, supplies (with the exception of magnetic media), industrial control devices, central office telephone switches, analog private branch exchanges (PBXs) or computer-output micrographic systems.

Currencies for foreign companies are computed based on the 1991 floating year figure provided by the Organization for Economic Cooperation and Development (OECD). The following currencies are equivalent to one U.S. dollar: Canadian dollar, 1.146; Danish krone, 6.398; French franc, 5.641; German deutsche mark, 1.659; Italian lire, 1,241; Japanese yen, 134.5; Korean won, 733.229; Dutch gulden, 1.87; Taiwanese dollar, 26.553; British pound, 0.567.

FOR MORE INFORMATION

Want even more information on the worldwide and North American DATAMATION 100 companies, or their products and services? Circle the appropriate numbers as listed below on the Reader Card on page 48.

Acer	**200**	Matsushita	**267**
Adobe	**201**	Maxtor	**268**
ADP	**202**	Memorex Telex	**269**
Amdahl	**203**	Mentor	**270**
American Express	**204**	Micropolis	**271**
American Management	**205**	Microsoft	**272**
Andersen Consulting	**206**	Mitac	**273**
Apple	**207**	Mitsubishi	**274**
ASK Computer	**208**	Motorola	**275**
AST Research	**209**	National Data	**276**
AT&T	**210**	NEC	**277**
Autodesk	**211**	Nihon Unisys	**278**
Bell Atlantic	**212**	Northern Telecom	**279**
Boeing	**213**	Nomura	**280**
Bolt Beranek & Newman	**214**	Novell	**281**
Borland	**215**	NTT	**282**
British Telecom	**216**	NYNEX	**283**
Cabletron	**217**	Oki	**284**
Cadence	**218**	Olivetti	**285**
Canon	**219**	Oracle	**286**
Cap Gemini	**220**	Packard Bell	**287**
C. Itoh	**221**	PRC	**288**
Commodore	**222**	Policy Management	**289**
Compaq	**223**	Price Waterhouse	**290**
Comparex	**224**	Prime	**291**
CompuAdd	**225**	Pyramid	**292**
Computer Associates	**226**	Quantum	**293**
Computer Task Group	**227**	Racal	**294**
Concurrent	**228**	Reynolds & Reynolds	**295**
Conner Peripherals	**229**	Ricoh	**296**
Control Data	**230**	SAS Institute	**297**
Coopers & Lybrand	**231**	Science Applications	**298**
Cray	**232**	SD-Scicon	**299**
CSC	**233**	Seagate	**300**
CSK	**234**	Seiko Epson	**301**
D&B Software	**235**	Sema Group	**302**
Data General	**236**	Sequent	**303**
Datapoint	**237**	Shared Medical	**304**
Dell	**238**	SHL	**305**
Diebold	**239**	Siemens Nixdorf	**306**
Digital	**240**	Silicon Graphics	**307**
EDS	**241**	Sligos	**308**
Ernst & Young	**242**	Sony	**309**
Everex	**243**	Sterling	**310**
Finsiel	**244**	StorageTek	**311**
FiServ	**245**	Stratus	**312**
Fujitsu	**246**	Sun	**313**
Gateway 2000	**247**	SynOptics	**314**
General Electric	**248**	Systematics	**315**
Genicom	**249**	Tandem	**316**
Gerber Scientific	**250**	Tandon	**317**
Getronics	**251**	Tandy	**318**
Groupe Bull	**252**	Tatung	**319**
Hewlett-Packard	**253**	Tektronix	**320**
Hitachi	**254**	Teradata	**321**
IBM	**255**	Texas Instruments	**322**
ICL	**256**	3Com	**323**
Information Builders	**257**	3M	**324**
Intec	**258**	Toshiba	**325**
Intel	**259**	TRW	**326**
Intergraph	**260**	Unisys	**327**
Kodak	**261**	Wang	**328**
Legent	**262**	Western Digital	**329**
Lockheed	**263**	WordPerfect	**330**
Lotus	**264**	Wyse	**331**
MAI Systems	**265**	Xerox	**332**
Martin Marietta	**266**	Zeos	**333**

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INSIDE

THE EDITOR'S VIEW

A Maturing Industry

When we first began the data collection effort for this year's DATAMATION 100, we suspected that 1991 might end up being the first year in our measurement history that the industry would not grow in dollar volume. In fact, because of the more than $4 billion loss in IS revenue at IBM last year and the effects of recession at many other companies, we even thought the industry would retract, falling into the negative column for the first time in this, the 11th year of the DATAMATION 100.

Well, the results are in, and it was a close shave. The DATAMATION 100 didn't go negative in 1991 but did post only the barest of increases. The worldwide computer industry, as measured by the DATAMATION 100, grew a scant 4.1% to $290 billion. And the North American segment inched upward even less, rising 2.9% to $190 billion.

Recession aside, what we think comes out loud and clear from this year's 100 effort is that a significant maturation of the industry is under way. And we might even suggest that a realignment of corporate power is under way, too. For the first time in the eight years we've been tracking the worldwide IT industry, the top spots in our ranking have changed significantly. Digital Equipment Corp., which has held the No. 2 spot worldwide since 1984 behind industry leader IBM, fell into fourth place (it did, however, hold onto its No. 2 spot in the North American market). The Maynard, Mass., company was succeeded by two Japanese companies, Fujitsu Ltd. and NEC Corp.

This year's DATAMATION 100 follows the three-part format we established last year. In this issue, we present our ranking of the top 100 suppliers of information technology products and services worldwide, as well as the top 100 IT suppliers incorporated in North America and profiles of the North American companies. In addition, we feature an exclusive interview with IBM president Jack Kuehler.

On July 1, our ranking of the top 25 Europe-based suppliers will appear, with profiles of all companies making that grade. And then on September 1 we conclude with the top 25 Asia-based companies.

All in all, it's a rapidly changing industry, with many new faces and players and different rules of competition. Understanding where things are going is critical for you, the consumers of information technology. We hope the DATAMATION 100 helps light the way.

—David R. Brousell, Editor-In-Chief

JESSE H. NEAL
EDITORIAL
ACHIEVEMENT
AWARD

Winner Jesse H. Neal Editorial Achievement Award 1986, 1987

Coming Next Issue:

- The European 25
- SynOptics's new intelligent hub
- Why Non-ISers are managing application development

World IT Sales Stagger 4.1% To $290 Billion

North American sales limp 2.9% to 190 billion as the computer industry matures.

Last year, American moviegoers were dazzled by the computer-based special effects in *Terminator 2*, especially the “morphing” sequence in which the alien metamorphoses from a tile floor into a police officer. The computer industry went through its own dramatic morphing experience, with profound effects on employees, stockholders and customers. It changed from a perky, rap-dancing teenager to a middle-aged couch potato.

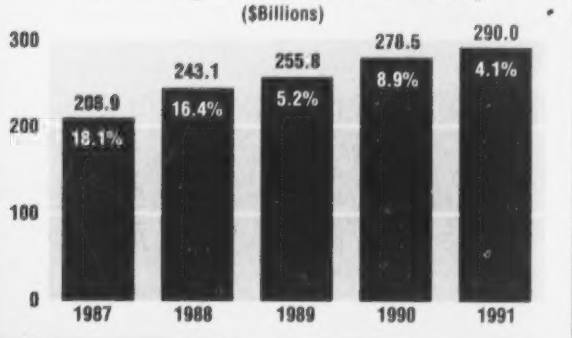
If you think that the industry's snooze through 1991 was just a nap induced by the recession, you're ignoring the signs of industrial aging. The computer industry has matured. Revenue growth of the worldwide DATAMATION 100 has been declining since the 21% jump in 1986. The meager 4.1% advance to $290.0 billion for the companies that lumbered into the DATAMATION 100 in 1991 reflects more than just a barely recovering economy in the United States, shaky prospects in Europe and the beginning of a recession in Japan.

Continued on page 14

Industry Growth Slows

As worldwide DATAMATION 100 revenues near $300 billion, growth has slowed dramatically.

($Billions)



BY LARRY MARION

The DATAMATION 100

The top 100 companies worldwide.

WORLD RANK '91	WORLD RANK '90	COMPANY	IS REVENUE '91	IS REVENUE '90	% CHANGE
1	1	IBM	62,840.0	67,090.0	-6.3%
2	3	Fujitsu	19,330.9	12,361.5	56.4%
3	4	NEC	15,317.6	12,350.3	24.0%
4	2	Digital	14,237.8	13,072.3	8.9%
5	7	Hewlett-Packard	10,726.0	9,514.5*	12.7%
6	5	Hitachi	10,310.2	9,590.9	7.5%
7	18	AT&T	8,169.0	2,900.0	181.7%
8	6	Unisys	8,000.0	9,302.0	-14.0%
9	8	Siemens Nixdorf	7,308.6	7,654.7*	-4.5%
10	11	Apple	6,496.0	5,740.0	13.2%
11	9	Olivetti	6,050.8	6,414.5	-5.7%
12	10	Groupe Bull	5,929.8	6,349.6	-6.6%
13	13	Toshiba	5,115.9	4,764.5	7.4%
14	15	Matsushita	5,068.8	4,240.4*	19.5%
15	14	Canon	3,751.5	4,040.1*	-7.1%
16	19	EDS	3,666.1	2,870.0	27.7%
17	22	Sun	3,454.7	2,762.8	25.0%
18	20	ICL	3,308.1	2,862.9	15.6%
19	16	Compaq	3,271.4	3,598.0	-9.1%
20	21	Xerox	2,930.0	2,800.0	4.6%
21	23	Seagate	2,668.7	2,667.6	0.0%
22	27	NTT	2,492.3	2,114.0	17.9%
23	25	Nihon Unisys	2,413.4	2,279.0	5.9%
24	42	Microsoft	2,275.9	1,480.0	53.8%
25	35	Andersen Consulting	2,260.0	1,880.0*	20.2%
26	28	Mitsubishi	2,203.7	2,055.5	7.2%
27	29	Oki	2,078.5	1,989.0	4.5%
28	34	Ricoh	1,970.3	1,774.3	11.0%
29	33	TRW	1,945.0	1,852.0	5.0%
30	38	CSC	1,944.7	1,679.3	15.8%
31	24	Wang	1,940.0	2,363.0	-17.9%
32	32	Tandem	1,932.9	1,873.1	3.2%
33	36	ADP	1,810.0	1,736.0*	4.3%
34	37	Cap Gemini	1,776.3	1,684.9	5.4%
35	39	C. Itoh	1,710.0	1,595.1	7.2%
36	26	Amdahl	1,702.0	2,158.8	-21.2%
37	43	Conner Peripherals	1,599.0	1,337.5	19.6%
38	49	StorageTek	1,584.9	1,545.2*	2.6%
39	40	Seiko Epson	1,539.0	1,590.7	-3.2%
40	30	Memorex Telex	1,533.1	1,634.9*	-6.2%
41	47	Northern Telecom	1,460.0	1,220.0	19.7%
42	44	Computer Associates	1,437.8	1,310.7	9.7%
43	41	Prime	1,382.4	1,589.0	-13.0%
44	46	Data General	1,212.0	1,237.4	-2.1%
45	52	Intergraph	1,195.4	1,044.6	14.4%
46	50	Control Data	1,172.6	1,121.9	4.5%
47	54	Intel	1,100.0	980.0	12.2%
48	51	Oracle	1,085.0	1,002.0*	8.3%
49	65	Quantum	1,073.6	716.3	49.9%
50	48	Tandy	1,070.6	1,208.0*	-11.4%
51	53	Commodore	1,038.5	995.7	4.3%
52	58	Finsiel	1,015.6	816.7*	24.3%
53	59	American Express	995.0	827.0	20.3%
54	55	Motorola	987.0	954.0	3.5%
55	62	Maxtor	961.0	789.4	21.7%
56	57	3M	935.0	875.0	6.9%
57	78	Dell	889.9	546.0	63.0%
58	60	Cray	862.5	804.4	7.2%
59	61	General Electric	850.0	800.0	6.3%
60	71	Lotus	828.9	692.2*	19.7%
61	74	AST Research	827.3	586.5	41.1%
62	63	British Telecom	823.6	776.8	6.0%
63	64	Acer	811.0	751.0	8.0%
64	70	Comparex	752.3	689.4	9.1%
65	66	Texas Instruments	747.9	700.0	6.8%
66	—	Price Waterhouse	733.0	583.0*	25.7%
67	83	Novell	710.4	526.3*	35.0%
68	—	Nomura	706.3	652.3*	8.3%
69	67	Racal	679.0	625.2*	8.6%
70	—	Packard Bell	675.9	518.0	30.5%
71	68	Tatung	667.3	593.4*	12.5%
72	75	Science Applications	653.0	569.0	14.8%
73	80	Sema Group	640.5	533.4	20.1%
74	86	Silicon Graphics	638.0	482.1	32.3%
75	—	Gateway 2000	635.0	275.0	130.9%
76	—	PRC	622.8	632.4*	-1.5%
77	73	SHL	601.2	599.0	0.4%
78	72	NYNEX	601.0	618.0	-2.8%
79	—	Coopers & Lybrand	571.0	538.8*	6.0%
80	81	Sligos	569.3	530.7	7.3%
81	77	Martin Marietta	561.1	549.4	2.1%
82	85	Ernst & Young	551.0	490.0	12.4%
83	—	Bell Atlantic	550.0	480.0*	14.6%
84	79	D & B Software	548.7	539.0	1.8%
85	76	CSK	542.3	527.2*	2.9%
86	91	Mitac	540.0	450.0*	20.0%
87	90	WordPerfect	532.5	452.4	17.7%
88	84	Lockheed	525.0	420.0*	25.0%
89	—	Sony	520.4	499.5*	4.2%
90	—	CompuAdd	513.6	N/A	N/A
91	—	Borland	501.6	418.4*	19.9%
92	95	Everex	492.5	427.6	15.2%
93	88	Wyse	478.4	460.0	40.0%
94	87	Western Digital	478.2	460.2	3.9%
95	89	SD-Scicon	472.7	455.6	3.7%
96	96	Tandon	461.4	439.9*	4.9%
97	97	Stratus	448.6	403.9	11.1%
98	—	Getronics	442.5	362.7	22.0%
99	—	Intec	440.9	402.7	9.5%
100	99	Shared Medical	438.7	403.1	8.8%

* Restated figure Revenue figures are in $ millions.

Signals of middle age abound, reflecting a maturation process similar to the one undergone by the automobile industry, the appliance industry and other fixtures of western civilization. "You won't see the 20% growth rates of the past again," says Richard O'Brian, corporate economist at Hewlett-Packard Co. and one of the industry's leading prognosticators. "You will see double-digit growth during a boom, maybe 10 to 15% per year, but not 20 to 30%." Other industry economists agree with O'Brian's outlook, but government economists are more pessimistic. The Commerce Department forecasts that the real output (i.e., subtracting out the effects of inflation and deflation) of U.S. computer equipment makers will grow at an annual rate of only 7.6% through the year 2005, "much lower than the 31.8% rate posted over the 1975 to 1990 period."

A key reason for the worldwide computer industry's slowing growth rate and maturation is its relative size. While most industry officials haven't noticed, the computer industry has grown to a hefty mass that more closely resembles other mature sectors of the economy. Last year, the $184.7 billion in IS revenue amassed by the North American DATAMATION 100 exceeded the $175.4 billion in sales of petroleum products, as recorded by the Commerce Department. That means that Digital Equipment Corp., HP, IBM and the other 97 firms collectively outweigh the oil businesses of Chevron Corp., Exxon Corp., Mobil Corp. and the rest of the oil-refining and -processing sector.

In fact, the Commerce Department's tallies of industry revenues show that the combined computer and electronics segments of the U.S. economy are 40% larger than the automobile industry—$287 billion for the electronics/computer segment versus $205 billion for the motor vehicles and parts businesses. In addition, Cahners Economics predicts that next year the computer and electronics sectors will constitute the largest single industry in the United States, narrowly exceeding the chemical industry as holder of the title—$322 billion versus $318 billion, respectively. So the pundits are correct—we are indeed in the information age.

Falling Fortunes

The North American companies that couldn't keep up in 1991.

	COMPANY	1991 IS REV.	1990 IS REV.	DECREASE
1	Amdahl	1,702.0	2,158.8	-21.2%
2	Concurrent	238.0	296.0	-19.6%
3	Wang	1,940.0	2,363.0	-17.9%
4	Genicom	200.5	238.2	-15.8%
5	3Com	370.0	437.0	-15.3%
6	Sequent	213.3	248.8	-14.3%
7	Unisys	8,000.0	9,302.0	-14.0%
8	MAI Systems	328.6	382.0	-14.0%
9	Prime	1,382.4	1,589.0	-13.0%
10	Tandy	1,070.6	1,208.0	-11.4%

All revenue figures in $ millions.

The Commerce Department predicts that the computer industry will be outpaced by the automobile industry this year.

Other signs of industrial maturity were clearly evident last year, when the strength of the recession stunned the industry. Market saturation, an overabundance of suppliers pummeling prices and imports equaling exports are three symptoms of middle age that became apparent last year. And their effects won't go away as the recovery gains steam.

Industry visionaries such as Bill Gates and Steve Jobs have dreamed of computer technology proliferating to the point of ubiquity, and the industry has come closer to success than most people realize. The Electronic Industries Association estimates that more than one-third of the nation's homes have a personal computer. Approximately 90% of the worldwide industry's overall consumer and corporate sales represent replacement business, according to HP's O'Brian, which means that the years of fertile growth due to an abundance of virgin territories are over. "It's becoming like the car market—in most cases, we're selling to a customer who already has one," O'Brian says. Although most households remain PC-less, growth of the home PC market is not going to spur dramatic computer industry growth over the next decade because the far larger business markets are almost entirely saturated.

Fast Trackers

The North American companies that grew the most in 1991.

	COMPANY	1991 IS REV.	1990 IS REV.	INCREASE
1	AT&T*	8,169.0	2,900.0	181.7%
2	Gateway 2000	635.0	275.0	130.9%
3	Zeos	230.9	127.1	81.7%
4	Cabletron	257.4	150.1	71.5%
5	Dell	889.9	546.0	63.0%
6	ASK Computer*	394.6	249.7	58.0%
7	Microsoft	2,275.9	1,480.0	53.8%
8	FiServ	281.3	183.0	53.7%
9	Quantum	1,073.6	716.3	49.9%
10	Systematics	377.0	255.0	47.8%

* Increase due to acquisition.
All revenue figures in $ millions.

Another significant sign of industrial aging is that the hardware portions of the U.S. computer industry last year ceased to be on the plus side of the U.S. trade ledger. The amount of computer equipment imported into the country equaled the amount exported for the first time, at about $26 billion. The leading exporters among the North American DATAMATION 100 sold $66.1 billion worth of goods and services abroad in 1991, down just slightly from the $66.3 billion shipped the prior year. U.S. consumer and corporate demand for low-cost PCs, for parts from Asian vendors and for laser printers from Japan have overtaken U.S. strengths in microprocessors, software and services.

Twelve new companies entered this year's worldwide DATAMATION 100.

Thus it should come as no surprise that there's a somber short-term prognosis for the computer industry in comparison with other industries. The Commerce Department predicts that the U.S. computer industry will be out paced by the mundane this year: makers of automobiles, trucks, refrigerators, vacuum cleaners and a host of other pedestrian goods will post better growth in 1992. Commerce predicts that the U.S. computer industry will achieve a 4.3% increase in revenue this year, while Ford Motor Co., General Electric Co., Hoover Co., Whirlpool Corp. and the remaining survivors of the industry shakeouts of the 1970s are expected to score a 5 to 7.4% gain.

Computer-industry economists are more upbeat about the prospects for 1992 than the Commerce Department, but all sides acknowledge that the industry's growth will lag behind that of the older sectors of the economy. O'Brian's computer-industry forecast is for 5 to 6% growth this year worldwide. Another leading industry forecaster, Vladi Catto, chief economist for Texas Instruments Inc. in Dallas, predicts 7% growth in 1992. Just about everyone expects the computer industry to rebound faster than the 3% increase in gross domestic product expected for the overall U.S. economy.

If the computer industry's revenue growth last year was a disappointment, the profit picture was a disaster, particularly among older, broad-based systems suppliers. Severance costs, other restructuring charges and operating losses by Digital, Eastman Kodak Co., IBM, Texas Instruments Inc., Unisys Corp. and others vitiated the industry's prior record of strong net earnings growth. In fact, net earnings for the North American DATAMATION 100 plummeted 72.3% from $27.1 billion in 1990 to a mere $7.5 billion in 1991. IBM had been the most profitable company in the United States for many years—its 1990 net earnings were in excess of $6 billion. IBM's decline last year from a growth company to a money loser reflects its own miscalculations as well as the industry's aging.

The red ink at Big Blue, Unisys and 25 other of the North American DATAMATION 100 companies last year compressed the sector's profits to near invisibility relative to other industries: the profitability of *Fortune* magazine's ranking of the 25 largest computer companies put that sector at No. 8 on the profit parade, as their collective profits rose only 1.1% last year. In contrast, *Fortune* shows the tobacco sector reaping 27% gains in net income and the drug companies swelling net earnings 16%.

Still, layoffs at Compaq Computer Corp., Data General Corp., Prime Computer Inc., TRW Inc. and other firms will eventually reduce the flow of red ink coming from their future income statements and will boost productivity. Even though U.S. hardware sales are expected to increase, the Commerce Department predicts that employment in the segment will shrink another 4.3% this year, after a 6% decline in 1991. Indeed, Commerce is predicting an annual 1% decline in employment of computer hardware makers through the year 2005.

Top Performers

The North American companies with the highest return on sales.

	COMPANY	1991 % RETURN ON SALES	1990% RETURN ON SALES
1	Novell	25.9	20.8
2	Microsoft	25.5	24.0
3	Adobe	22.5	23.7
4	Autodesk	20.3	23.9
5	Cabletron	20.0	19.8
6	Legent	17.4	19.2
7	Intel	17.1	16.6
8	ADP	13.2	12.7
9	Cray	13.1	14.0
10	Computer Associates	12.0	12.4

Also, the industry's greater emphasis on software and services will improve its lagging performance. Such vendors as Andersen Consulting and Electronic Data Systems Corp., which sell custom programming, systems integration, facilities management and other computer services, are the frisky offspring of the mature computer industry. They face little price competition and growing opportunities. The plague of local area network incompatibilities faced by MIS depart-

Continued on page 20

The DATAMATION North American 100

RANK 1991	RANK 1990	COMPANY	1991 IS REV.	1990 IS REV.	IS REV. % CHANGE	1991 TOTAL REV.	IS AS % OF TOTAL REV.	NET EARNINGS 1991	NET EARNINGS 1990
1	1	IBM	62,840.0	67,090.0	-6.3%	64,792.0	97.0%	-2,827.0	6,020.0
2	2	Digital	14,237.8	13,072.3	8.9%	14,237.8	100.0%	-864.4	-94.5
3	4	Hewlett-Packard	10,726.0	9,514.5*	12.7%	14,949.0	71.8%	856.0	771.0*
4	8	AT&T	8,169.0	2,900.0	181.7%	63,089.0	12.9%	522.0	2,735.0
5	3	Unisys	8,000.0	9,302.0	-14.0%	8,696.0	92.0%	-1,393.0	-437.0
6	5	Apple	6,496.0	5,740.0	13.2%	6,539.1	99.3%	325.4	500.6
7	9	EDS	3,666.1	2,870.0	27.7%	7,099.0	51.6%	547.5	496.9
8	11	Sun	3,454.7	2,762.8	25.0%	3,454.7	100.0%	199.3	151.0
9	7	Compaq	3,271.4	3,598.0	-9.1%	3,271.4	100.0%	130.9	454.9
10	10	Xerox	2,930.0	2,800.0	4.6%	17,830.0	16.4%	454.0	243.0
11	12	Seagate	2,668.7	2,667.6	0.0%	2,668.7	100.0%	-11.1	99.7
12	21	Microsoft	2,275.9	1,480.0	53.8%	2,275.9	100.0%	581.4	355.6
13	17	Andersen Consulting	2,260.0	1,880.0*	20.2%	2,260.0	100.0%	N/A	N/A
14	16	TRW	1,945.0	1,852.0	5.0%	7,913.0	24.6%	-140.0	208.0
15	19	CSC	1,944.7	1,679.3	15.8%	1,944.7	100.0%	65.5	68.0
16	13	Wang	1,940.0	2,363.0	-17.9%	1,940.0	100.0%	-380.0	-665.4
17	15	Tandem	1,932.9	1,873.1	3.2%	1,932.9	100.0%	-66.5	98.1
18	18	ADP	1,810.0	1,736.0*	4.3%	1,810.0	100.0%	238.9	219.7*
19	14	Amdahl	1,702.0	2,158.8	-21.2%	1,702.0	100.0%	11.0	184.0
20	22	Conner Peripherals	1,599.0	1,337.5	19.6%	1,599.0	100.0%	92.5	130.0*
21	27	StorageTek	1,584.9	1,545.2*	2.6%	1,584.9	100.0%	93.1	92.4*
22	25	Northern Telecom	1,460.0	1,220.0	19.7%	8,182.5	17.8%	496.5	460.2
23	23	Computer Associates	1,437.8	1,310.7	9.7%	1,437.8	100.0%	173.0	162.0
24	20	Prime	1,382.4	1,589.0	-13.0%	1,382.4	100.0%	-16.9	56.4*
25	24	Data General	1,212.0	1,237.4	-2.1%	1,212.0	100.0%	77.2	-106.9*
26	30	Intergraph	1,195.4	1,044.6	14.4%	1,195.4	100.0%	71.1	62.6
27	28	Control Data	1,172.6	1,121.9	4.5%	1,524.9	76.9%	-9.8	2.7
28	32	Intel	1,100.0	980.0	12.2%	4,778.6	23.0%	818.6	650.0
29	29	Oracle	1,085.0	1,002.0*	8.3%	1,085.0	100.0%	76.0	20.0*
30	39	Quantum	1,073.6	716.3	49.9%	1,073.6	100.0%	49.6	66.7
31	26	Tandy	1,070.6	1,208.0*	-11.4%	4,514.8	23.7%	176.5	260.5*
32	31	Commodore	1,038.5	995.7	4.3%	1,038.5	100.0%	50.1	40.2
33	35	American Express	995.0	827.0	20.3%	25,763.0	3.9%	789.0	181.0
34	33	Motorola	987.0	954.0	3.5%	11,341.0	8.7%	454.0	499.0
35	38	Maxtor	961.0	789.4	21.7%	961.0	100.0%	-65.7	10.8
36	34	3M	935.0	875.0	6.9%	13,340.0	7.0%	1,154.0	1,308.0
37	48	Dell	889.9	546.0	63.0%	889.9	100.0%	50.9	27.2
38	36	Cray	862.5	804.4	7.2%	862.5	100.0%	113.0	113.0
39	37	General Electric	850.0	800.0	6.3%	60,236.0	1.4%	2,636.0	4,300.0
40	42	Lotus	828.9	692.2*	19.7%	828.9	100.0%	43.1	23.3
41	45	AST Research	827.3	586.5	41.1%	827.3	100.0%	70.2	52.5
42	40	Texas Instruments	747.9	700.0	6.8%	6,784.0	11.0%	-409.0	-39.0
43	67	Price Waterhouse	733.0	583.0*	25.7%	3,603.0	20.3%	N/A	N/A
44	50	Novell	710.4	526.3*	35.0%	710.4	100.0%	184.3	109.7*
45	—	Packard Bell	675.9	518.0	30.5%	819.5	82.5%	4.6	8.5
46	46	Science Applications	653.0	569.0	14.8%	1,280.0	51.0%	35.0	33.3
47	53	Silicon Graphics	638.0	482.1	32.3%	638.0	100.0%	36.6	39.8
48	—	Gateway 2000	635.0	275.0	130.9%	635.0	100.0%	N/A	N/A
49	—	PRC	622.8	632.4	-1.5%	685.2	90.9%	N/A	N/A
50	44	SHL	601.2	599.0	0.4%	601.2	100.0%	-17.5	-35.0

* Restated figure   N/A = Not available   All revenue figures are in $ millions.

The DATAMATION North American 100

RANK 1991	RANK 1990	COMPANY	1991 IS REV.	1990 IS REV.	IS REV. % CHANGE	1991 TOTAL REV.	IS AS % OF TOTAL REV.	NET EARNINGS 1991	NET EARNINGS 1990
51	43	NYNEX	601.0	618.0	-2.8%	13,228.8	4.5%	600.8	949.4
52	90	Coopers & Lybrand	571.0	538.8*	6.0%	1,472.0	38.8%	N/A	N/A
53	47	Martin Marietta	561.1	549.4	2.1%	6,075.4	9.2%	313.1	327.6
54	52	Ernst & Young	551.0	490.0	12.4%	5,400.0	10.2%	N/A	N/A
55	68	Bell Atlantic	550.0	480.0*	14.6%	12,279.7	4.5%	-222.7	1,312.5
56	49	D & B Software	548.7	539.0	1.8%	548.7	100.0%	N/A	N/A
57	56	WordPerfect	532.5	452.4	17.7%	532.5	100.0%	N/A	N/A
58	51	Lockheed	525.0	420.0*	25.0%	9,800.0	5.4%	308.0	335.0
59	—	CompuAdd	513.6	N/A	N/A	513.6	100.0%	N/A	N/A
60	—	Borland	501.6	418.4*	19.9%	501.6	100.0%	-80.7	5.6
61	59	Everex	492.5	427.6	15.2%	492.5	100.0%	-31.4	-0.8
62	55	Wyse	478.4	460.0	4.0%	478.4	100.0%	N/A	N/A
63	54	Western Digital	478.2	460.2	3.9%	915.8	52.2%	-95.5	-78.6
64	60	Tandon	461.4	439.9*	4.9%	461.4	100.0%	-48.0	25.6
65	61	Stratus	448.6	403.9	11.1%	448.6	100.0%	49.7	37.0
66	62	Shared Medical	438.7	403.1	8.8%	438.7	100.0%	25.3	22.7
67	58	Mentor	400.1	435.2	-8.1%	400.1	100.0%	-61.6	23.6
68	81	ASK Computer	394.6	249.7	58.0%	394.6	100.0%	-57.6	4.7
69	72	Kodak	390.0	350.0*	11.4%	19,419.0	2.0%	-688.0	703.0
70	79	Systematics	377.0	255.0	47.8%	377.0	100.0%	N/A	N/A
71	57	3Com	370.0	437.0	-15.3%	370.0	100.0%	-33.0	24.0
72	69	Diebold	355.0	328.4	8.1%	506.2	70.1%	35.7	27.1
73	91	Cadence	353.0	322.0*	9.6%	392.0	90.1%	-22.0	6.0
74	66	Micropolis	350.9	381.0	-7.9%	350.9	100.0%	4.3	8.0
75	76	Policy Management	342.0	272.0	25.7%	415.4	82.3%	47.6	37.2
76	64	MAI Systems	328.6	382.0*	-14.0%	328.6	100.0%	-59.8	-84.8*
77	71	Boeing	325.4	320.0	1.7%	29,314.0	1.1%	1,567.0	1,358.0*
78	—	Teradata	297.0	237.8	24.9%	297.0	100.0%	9.1	N/A
79	85	SAS Institute	295.1	240.2	22.9%	295.1	100.0%	N/A	N/A
80	78	American Management	285.2	261.9	8.9%	285.2	100.0%	11.6	10.4
81	84	Computer Task Group	285.1	243.9	16.9%	285.1	100.0%	0.9	7.2
82	86	Autodesk	284.9	237.9	19.8%	284.9	100.0%	57.8	56.8
83	74	Tektronix	283.0	291.4	-2.9%	1,311.0	21.6%	44.9	-70.1
84	—	FiServe	281.3	183.0	53.7%	281.3	100.0%	18.0	14.0
85	77	Datapoint	263.9	265.6	-0.6%	263.9	100.0%	0.3	-66.7
86	75	Gerber Scientific	261.0	279.8	-6.7%	261.0	100.0%	7.4	32.4
87	—	Cabletron	257.4	150.1	71.5%	262.6	98.0%	52.4	31.0
88	—	SynOptics	248.3	176.0	41.1%	248.3	100.0%	26.8	28.2
89	73	Concurrent	238.0	296.0	-19.6%	238.0	100.0%	14.4	-60.0
90	80	Reynolds & Reynolds	232.8	254.2*	-8.4%	591.7	39.3%	25.6	22.7*
91	—	Zeos	230.9	127.1	81.7%	230.9	100.0%	10.3	4.2
92	—	Adobe	229.7	168.7	36.1%	229.7	100.0%	51.6	40.1
93	94	Sterling	228.9	207.0	10.6%	228.9	100.0%	13.1	12.4
94	97	Pyramid	221.6	200.5	10.6%	221.6	100.0%	-11.1	18.4
95	83	National Data	220.6	244.6	-9.8%	220.6	100.0%	-14.6	5.5
96	82	Sequent	213.3	248.8	-14.3%	213.3	100.0%	-48.7	18.8
97	—	Legent	207.8	180.5	15.1%	207.8	100.0%	36.2	34.7
98	95	Bolt Beranek & Newman	206.6	204.3	1.1%	262.9	78.6%	6.6	-34.8
99	100	Information Builders	202.3	191.0*	5.9%	202.3	100.0%	N/A	N/A
100	—	Genicom	200.5	238.2	-15.8%	217.0	92.4%	-13.0	6.6

* Restated figure   N/A = Not available   All revenue figures are in $ millions.

ments initiating downsizing programs is leading to large, new networking contracts with these companies. Corporate edicts to reduce costs by reengineering existing processes were manna from heaven for Digital, IBM and other product vendors in the services business. Overall, last year the services sector of the worldwide DATAMATION 100 achieved 13.3% revenue growth.

In fact, the Commerce Department predicts 20% annual growth for the services revenue of U.S. computer companies over the next five years. The Commerce Department cites figures from Input Inc. of Mountain View, Calif., predicting that the global market for information services will grow 16% annually through the year 1995 to total $420 billion.

Input's and Commerce's definition of computer services includes the burgeoning on-line database access business and audiotex services like 900 numbers, as well as systems integration, custom-programming and more traditional data-processing services. The services of most interest to IS managers—systems integration, custom programming, consulting and training—will generate $56 billion in revenue this year, according to the Commerce Department, a 14% increase from 1991's level.

In The Red

The 10 North American companies that lost the most money.

	COMPANY	1991 EARNINGS LOSS ($ MIL.)
1	IBM	-2,827.0
2	Unisys	-1,393.0
3	Digital	-864.4
4	Kodak	-688.0
5	Texas Instruments	-409.0
6	Wang	-380.0
7	Bell Atlantic	-222.7
8	TRW	-140.0
9	Western Digital	-95.5
10	Borland	-80.7

Software is another feisty offspring. Software-based revenue for the worldwide DATAMATION 100 jumped 17.2% last year. And the software sector's share of the DATAMATION 100's revenue pie increased 1.3 percentage points to $33 billion in 1991.

Microsoft Corp. was the software industry revenue growth champion, achieving a 53.8% gain to $2.28 billion without the aid of acquisitions or hardware sales. Its stupendous growth, due to the Windows operating system and related applications software, again proves that Gates and his team are business whizzes as well as a programming wizards. However, IBM retains its lead in the software sector's revenue parade, thanks to ever higher prices for the software required to run its mainframes, midrange systems and workstations. Big Blue registered $10.5 billion in software revenue in 1991, a 5.7% increase.

Thirteen new companies entered North American DATAMATION 100.

Mainframe software prices may be rising, but mainframe hardware revenue barely inched ahead at 3.0% last year for IBM and the other vendors plowing that exhausted field. Reduced hardware, software and maintenance costs for alternative computer platforms continued to diminish the importance of the Big Iron. Over the past five years, the proportion of worldwide industry revenues stemming from mainframes has declined from 12.6 to 9.5%, and recent DATAMATION IS spending surveys show further deterioration in the U.S. mainframe market this year, as ever more powerful PCs continue to supplant larger machines as the platform of choice for new applications development.

Last year was another dismal failure for many makers of minicomputers and other midrange machines. Overall worldwide revenue was $22.1 billion in 1991, up only 2.3% from the prior year. Digital was clearly in the worst shape—its VAX minicomputer line is declining faster than the company can introduce its next generation of products, to be based on its hot new Alpha reduced instruction set computing (RISC) microprocessor. Other mini makers are also hurting. Wang Laboratories Inc. essentially abandoned the high costs of staying in the hardware business (its minicomputer revenue dropped 18%) by agreeing to resell IBM's midrange systems. Poor Prime Computer lost $16.9 million in earnings while registering a 13% drop in revenue to $1.38 billion. It is phasing out of the proprietary hardware game as it continues its "morph" from a minicomputer maker into basically a computer-aided design and manufacturing (CAD/CAM) software company.

Several minicomputer vendors appeared to be on the road back to financial viability in 1991. Last year, Data General Corp. should have won some "Comeback Of The Year" honors for its improved performance based on its AViiON line of UNIX servers—profits were up a dramatic 77.2%. However, in early 1992 its financial performance weakened.

HP's and IBM's minicomputer businesses were in relatively healthy shape, thanks to new products and sharp marketing. HP's shift to a RISC-based architecture several years ago gave it bragging rights to one of the best price/performance ratios in the industry. Accordingly, its midrange revenue was up 13.7% last year to $832 million, according to DATAMATION estimates. IBM's minicomputer business continues strong, based on the acceptance of the AS/400. Its minicomputer revenue was up, albeit only 1.2%, to $5.9 billion.

Peripherals became another casualty of the industry's maturity in 1991. Unit sales of laser printers are booming, but declining prices are compressing revenues. Last year, worldwide sales of peripherals dropped 2.4% to $60.7 billion. IBM's peripherals revenue slumped 17.1% for several reasons, including the divestiture of its printer division and the growing competitiveness of the makers of plug-compatible equipment.

Declining prices for data communications equipment overshadowed strong gains in shipments. Last year, worldwide sales of modems, multiplexers, network controllers and other gear declined 13% to $15.4 billion. Typical of the market carnage was the bloodbath in the modem business. Modem makers played chicken with each other—some on-line data services and software companies gave away 2,400-baud modems to attract new subscribers. Last year, retail modem prices declined 30 to 50%, depending on the speed, according to Dataquest Inc. of San Jose. Motorola Inc.'s datacom business was one of many to take a hit—a 2% decline in revenues and a 13% decline in profits. IBM suffered a 32% decline in datacom revenues.

Nowhere is the maturation of the computer industry more obvious than in the personal computer market. Direct marketing of a product is a sure sign of a commodity business, which in itself is one of the criteria for a mature market. Upstart vendors CompuAdd Computer Corp., Dell Computer Corp., Gateway 2000 Inc. and Zeos International Ltd. climbed into the North American DATAMATION 100 on the backs of Compaq, IBM and other more-established players. PC revenues were up 7.5% for the worldwide DATAMATION 100 members this year, although unit shipments grew faster thanks to dramatically declining prices, according to the Framingham, Mass.-based market research firm International Data Group.

Heightened competition in the PC arena is starting to infect the workstation business. The business may still be exhibiting strong growth—workstation sales of the worldwide DATAMATION 100 jumped 27.4% to $13.5 billion last year. And Big Blue's workstation revenue leaped 40% thanks to its RISC box, the RS/6000. But the workstation arena is rapidly becoming a commodity market driven by price. HP's "Save $5. Gain 14MIPS" ads are typical of the price wars that are rapidly maturing the market from its narrow niche in scientific circles to a broader commercial realm. Sun Microsystems Inc. managed to retain first place in terms of revenue despite the furious attacks by HP and IBM.

Innovations like RISC, open systems and the client/server architecture show that the computer industry, although maturing, isn't dead yet. In fact, the Commerce Department predicts that software and services will grow at double-digit rates for the rest of the decade. In the not too distant future the combined software and services revenues of the DATAMATION 100 will exceed those of the hardware sectors.

Indeed, the growth achieved by the DATAMATION 100 during the past decade is remarkable. In the less than 50 years since the invention of the transistor at AT&T Bell Laboratories ushered in the modern electronics era, the leading computer companies have grown to the point where their revenues collectively exceed those of industries that are centuries old. This achievement should come as some consolation to the industry, and should provide industry officials with some solace as they face the deceleration of the industry's growth. Unlike Peter Pan, everyone has to grow up. ■

Big Exporters In North America

The North American companies with the most IS sales outside their home market.

	COMPANY	NORTH AMERICA	EUROPE	ASIA PACIFIC	OTHER
1	IBM	26,392.8	25,136.0	8,797.6	2,513.6
2	Digital	5,410.4	6,549.4	2,278.0	0.0
3	Hewlett-Packard	4,719.4	3,968.6	2,037.9	0.0
4	Unisys	4,080.0	2,400.0	1,520.0	0.0
5	Apple	3,897.6	1,883.8	714.6	0.0
6	AT&T	6,208.4	1,470.4	245.1	245.1
7	Compaq	1,341.3	1,635.7	229.0	65.4
8	Sun	1,692.8	1,036.4	725.5	0.0
9	Xerox	1,465.0	966.9	146.5	351.6
10	Microsoft	1,115.2	682.8	295.9	182.1

All revenue figures in $ millions

Larry Marion, a former assistant managing editor of DATAMATION, is an editor and writer based in Newton, Mass.

Global Leaders

The top 15 companies worldwide in each of nine product segments. North American companies are in bold.

Large-Scale Systems

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**IBM**	**9,100.0**	**10,632.0**	**-14.4%**	**33.1%**
2	Fujitsu	4,446.1	2,843.1	56.4%	16.2%
3	Hitachi	3,501.9	3,412.2	2.6%	12.7%
4	NEC	3,063.5	2,593.6	18.1%	11.1%
5	**Amdahl**	**987.2**	**1,360.0**	**-27.4%**	**3.6%**
6	Nihon Unisys	965.4	951.0	1.5%	3.5%
7	Siemens Nixdorf	964.4	1,018.5	-5.3%	3.5%
8	**Unisys**	**850.0**	**1,016.0**	**-16.3%**	**3.1%**
9	Groupe Bull	830.2	825.4	0.6%	3.0%
10	**Cray**	**682.0**	**590.2**	**15.5%**	**2.5%**
11	ICL	582.0	392.0	48.5%	2.1%
12	**Control Data**	**300.0**	**265.0**	**13.2%**	**1.1%**
13	Comparex	285.9	249.4	14.6%	1.0%
14	**AT&T**	**200.0**	**N/A**	**N/A**	**0.7%**
15	Mitsubishi	198.3	150.8	31.5%	0.7%

* Percentage share of DTM100 revenues.
N/A = Not applicable

Workstations

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**Sun**	**2,455.3**	**1,934.0**	**27.0%**	**18.2%**
2	**IBM**	**1,400.0**	**1,000.0**	**40.0%**	**10.4%**
3	Fujitsu	1,353.2	865.3	56.4%	10.1%
4	**Digital**	**1,250.0**	**1,250.0**	**0.0%**	**9.3%**
5	**Hewlett-Packard**	**1,055.0**	**920.0**	**14.7%**	**7.8%**
6	Matsushita	1,013.8	848.1	19.5%	7.5%
7	**Intergraph**	**616.0**	**344.7**	**78.7%**	**4.6%**
8	C. Itoh	594.8	558.3	6.5%	4.4%
9	**Silicon Graphics**	**550.0**	**414.6**	**32.7%**	**4.1%**
10	**Prime**	**379.2**	**405.3****	**6.4%**	**2.8%**
11	Toshiba	319.7	285.9	11.8%	2.4%
12	Hitachi	312.3	192.1	62.6%	2.3%
13	**Xerox**	**310.0**	**310.0**	**0.0%**	**2.3%**
14	**Dell**	**222.5**	**N/A**	**N/A**	**1.7%**
15	Siemens Nixdorf	211.0	154.3	36.7%	1.6%

* Percentage share of DTM100 revenues.
** Restated figure
N/A = Not applicable

Midrange

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**IBM**	**5,870.0**	**5,801.0**	**1.2%**	**26.5%**
2	**Digital**	**2,730.0**	**2,830.0**	**-3.5%**	**12.3%**
3	Fujitsu	2,609.7	1,668.8	56.4%	11.8%
4	NEC	1,838.1	1,482.0	24.0%	8.3%
5	Toshiba	1,332.1	1,239.0	7.5%	6.0%
6	**Unisys**	**945.0**	**1,100.0**	**-14.1%**	**4.3%**
7	Siemens Nixdorf	934.3	925.9	0.9%	4.2%
8	**Hewlett-Packard**	**832.0**	**732.0**	**13.7%**	**3.8%**
9	**Tandem**	**790.0**	**770.0****	**2.6%**	**3.6%**
10	**AT&T**	**550.0**	**150.0**	**266.7%**	**2.5%**
11	Hitachi	513.0	398.6	28.7%	2.3%
12	Mitsubishi	484.8	490.0	-1.0%	2.2%
13	Olivetti	478.6	526.6	-9.1%	2.2%
14	**Stratus**	**367.7**	**403.9**	**-9.0%**	**1.7%**
15	Groupe Bull	355.8	317.5	12.1%	1.6%

* Percentage share of DTM100 revenues
** Restated figure

Software

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**IBM**	**10,524.0**	**9,952.0**	**5.7%**	**31.5%**
2	Fujitsu	2,513.0	1,607.0	56.4%	7.5%
3	**Microsoft**	**2,045.9**	**1,323.0**	**54.6%**	**6.1%**
4	NEC	1,761.5	1,358.5	29.7%	5.3%
5	**Computer Associates**	**1,437.8**	**1,310.7**	**9.7%**	**4.3%**
6	**Oracle**	**1,085.0**	**1,002.0****	**8.3%**	**3.2%**
7	Siemens Nixdorf	964.4	925.9	4.2%	2.9%
8	Hitachi	959.1	798.1	20.2%	2.9%
9	**Lotus**	**828.9**	**642.2****	**29.1%**	**2.5%**
10	**Digital**	**796.0**	**810.0**	**-1.7%**	**2.4%**
11	Sema Group	640.5	533.4	20.1%	1.9%
12	**Novell**	**632.6**	**388.1**	**63.0%**	**1.9%**
13	Olivetti	630.8	621.3	1.5%	1.9%
14	ICL	625.6	492.0	27.1%	1.9%
15	Finsiel	609.4	490.0	24.3%	1.8%

* Percentage share of DTM100 revenues.
** Restated figure

Personal Computers

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**IBM**	**8,505.0**	**9,644.0**	**-11.8%**	**19.3%**
2	**Apple**	**4,900.0**	**3,845.8**	**27.4%**	**11.1%**
3	NEC	4,135.8	3,211.1	28.8%	9.4%
4	**Compaq**	**3,271.4**	**3,598.0**	**-9.1%**	**7.4%**
5	Fujitsu	2,319.7	1,419.6	63.4%	5.3%
6	Toshiba	2,093.5	1,953.7	7.2%	4.7%
7	Olivetti	1,586.1	1,791.7	-11.5%	3.6%
8	**Unisys**	**1,061.0**	**1,181.0**	**-10.2%**	**2.4%**
9	**Intel**	**1,050.0**	**980.0**	**7.1%**	**2.4%**
10	**Commodore**	**1,038.5**	**995.7**	**4.3%**	**2.4%**
11	**AT&T**	**950.0**	**700.0**	**35.7%**	**2.2%**
12	Groupe Bull	889.5	1,142.9	-22.2%	2.0%
13	Hitachi	825.3	718.4	14.9%	1.9%
14	**AST Research**	**800.7**	**516.2**	**55.1%**	**1.8%**
15	**Tandy**	**750.0**	**850.3**	**-11.8%**	**1.7%**

* Percentage share of DTM100 revenues

Peripherals

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	**IBM**	**10,278.0**	**12,405.0**	**-17.1%**	**17.0%**
2	**Hewlett-Packard**	**4,370.0**	**3,820.0**	**14.4%**	**7.2%**
3	Canon	3,139.0	2,399.8	30.8%	5.2%
4	Hitachi	3,092.9	2,824.6	9.5%	5.1%
5	Fujitsu	2,996.3	1,916.0	56.4%	5.0%
6	**Digital**	**2,900.0**	**3,000.0**	**-3.3%**	**4.8%**
7	**Seagate**	**2,668.7**	**2,667.6**	**0.0%**	**4.4%**
8	Matsushita	2,179.6	1,823.4	19.5%	3.6%
9	NEC	2,144.5	1,729.0	24.0%	3.6%
10	**AT&T**	**2,100.0**	**150.0**	**1,300.0%**	**3.5%**
11	Siemens Nixdorf	1,733.0	1,944.4	-10.9%	2.9%
12	**Conner Peripherals**	**1,599.0**	**1,337.5**	**19.6%**	**2.6%**
13	**Apple**	**1,346.0**	**1,722.0**	**-21.8%**	**2.2%**
14	Oki	1,247.1	1,141.3	9.3%	2.1%
15	**Xerox**	**1,200.0**	**1,100.0**	**9.1%**	**2.0%**

* Percentage share of DTM100 revenues

Data Communications

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	IBM	2,000.0	2,950.0	-32.2%	13.1%
2	AT&T	1,790.0	1,465.0	22.2%	11.8%
3	NTT	1,495.4	1,230.3	21.5%	9.8%
4	Northern Telecom	1,460.0	1,220.0	19.7%	9.6%
5	Matsushita	1,267.2	1,080.1	19.5%	8.3%
6	Ricoh	892.2	837.4	6.5%	5.9%
7	Racal	679.0	625.2	8.6%	4.5%
8	Toshiba	639.5	571.8	11.8%	4.2%
9	Fujitsu	579.9	370.8	56.4%	3.8%
10	Mitsubishi	550.9	492.0	12.0%	3.6%
11	Hewlett-Packard	450.0	400.0	12.5%	3.0%
12	Hitachi	408.9	386.7	5.7%	2.7%
13	British Telecom	391.5	372.9	5.0%	2.6%
14	Unisys	380.0	425.0	-10.6%	2.5%
15	Xerox	380.0	380.0	0.0%	2.5%

* Percentage share of DTM100 revenues.

Services

	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	EDS	3,666.1	2,870.0	27.7%	11.3%
2	Andersen Consulting	2,083.0	1,670.2**	24.7%	6.4%
3	IBM	2,018.0	1,500.0	34.5%	6.2%
4	CSC	1,944.7	1,679.3	15.8%	6.0%
5	TRW	1,839.0	1,739.0	5.8%	5.7%
6	ADP	1,810.0	1,736.0**	4.3%	5.6%
7	Digital	1,570.3	1,162.3	35.1%	4.9%
8	Fujitsu	1,546.5	988.9	56.4%	4.8%
9	Cap Gemini	1,492.1	1,465.9	1.8%	4.6%
10	NTT	996.9	883.7	12.8%	3.1%
11	American Express	995.0	827.0	20.3%	3.1%
12	Price Waterhouse	733.0	583.0**	25.7%	2.3%
13	Nomura	706.3	652.3	8.3%	2.2%
14	General Electric	650.0	600.0	8.3%	2.0%
15	PRC	622.8	632.4	-1.5%	1.9%

* Percentage share of DTM100 revenues.
** Restated figure

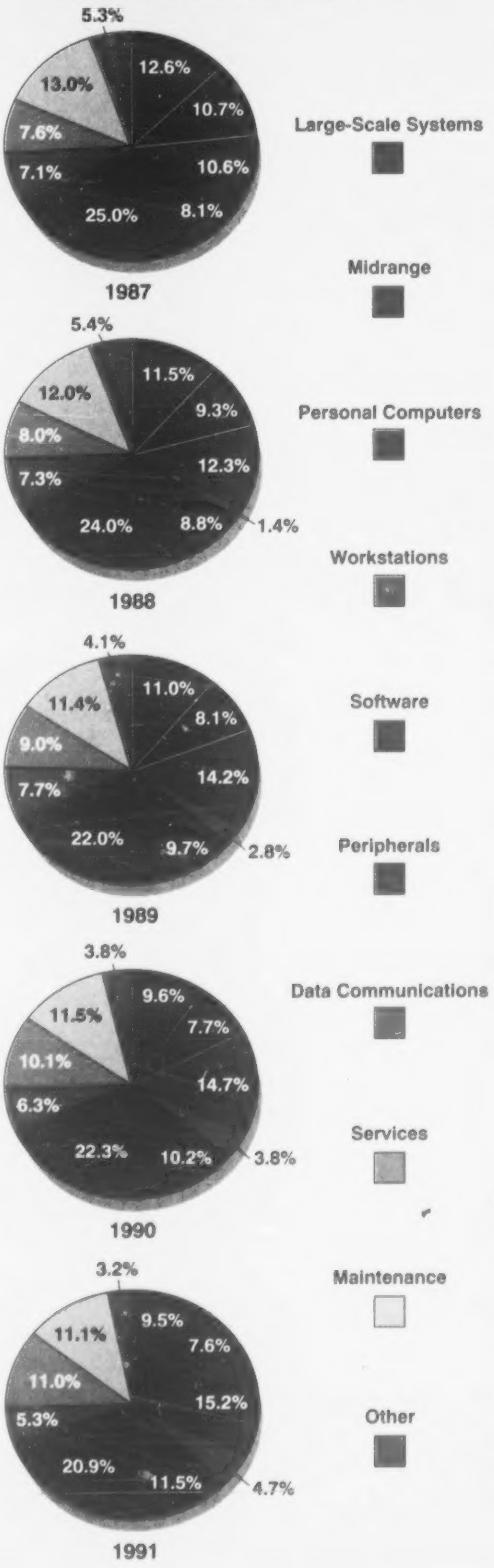
Maintenance

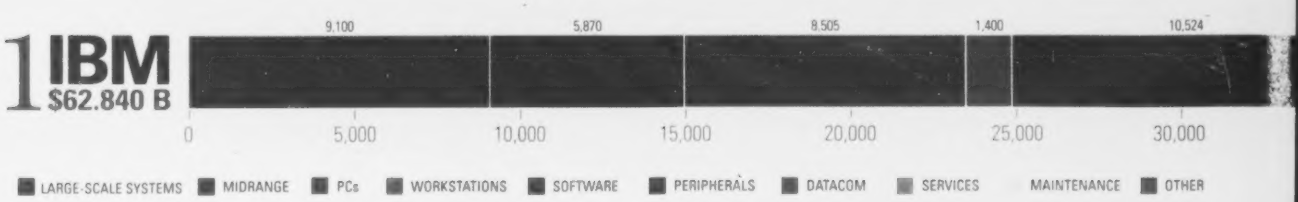
	COMPANY	REVENUE ($MIL.) 1991	1990	% CHANGE	MARKET SHARE*
1	IBM	7,414.0	7,768.0	-4.6%	22.9%
2	Digital	4,421.5	3,450.0	28.2%	13.7%
3	Hewlett-Packard	2,959.0	2,503.0	18.2%	9.2%
4	Unisys	1,844.0	1,990.0	-7.3%	5.7%
5	AT&T	1,729.0	200.0	764.5%	5.3%
6	Siemens Nixdorf	1,446.7	1,654.9	-12.6%	4.5%
7	Groupe Bull	1,363.9	1,333.4	2.3%	4.2%
8	Olivetti	1,094.5	1,106.6	-1.1%	3.4%
9	Fujitsu	966.5	618.1	56.4%	3.0%
10	NEC	892.2	741.0	20.4%	2.8%
11	Xerox	820.0	820.0	0.0%	2.5%
12	Wang	818.0	994.0	-17.7%	2.5%
13	ICL	752.2	669.0	12.4%	2.3%
14	Prime	575.0	635.6	-9.5%	1.8%
15	Bell Atlantic	495.0	432.0**	14.6%	1.5%

* Percentage share of DTM100 revenues.
** Restated figure

Five-Year Perspective

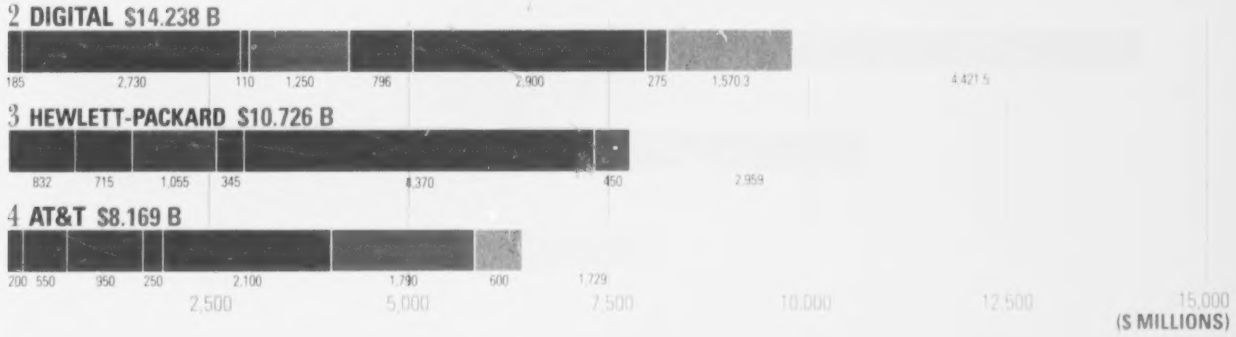
Market share by product segment since 1987.

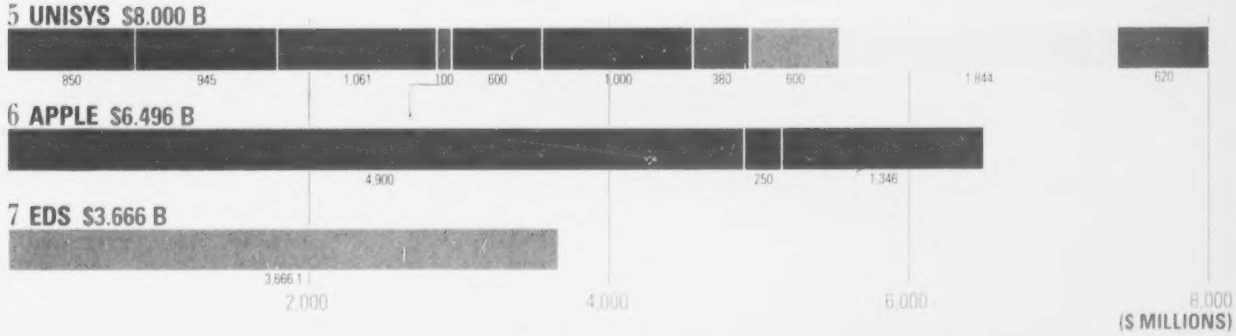


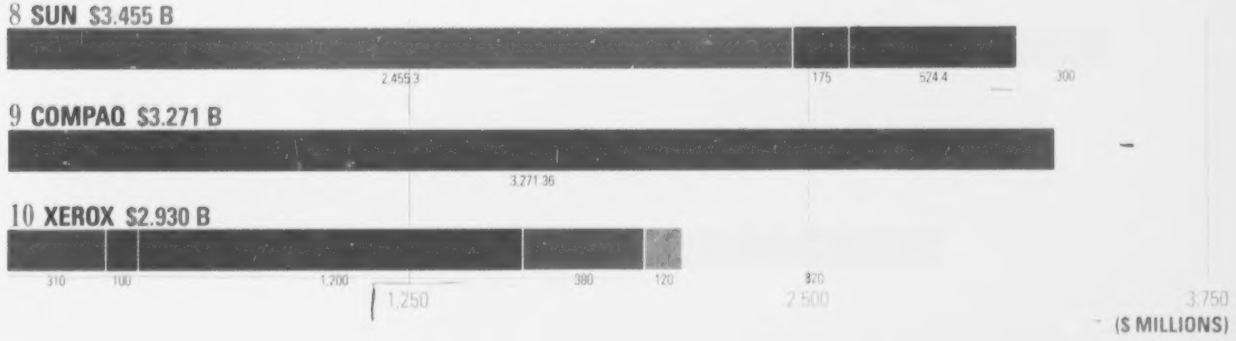


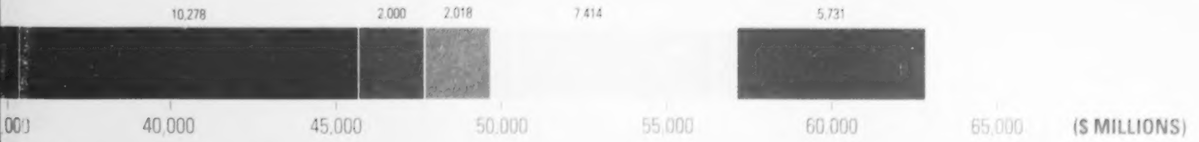
THE NORTH AMERICAN TOP 25

Microsoft rockets nine places; Amdahl skids five.
Sun breaks into the top 10, StorageTek joins the crowd.





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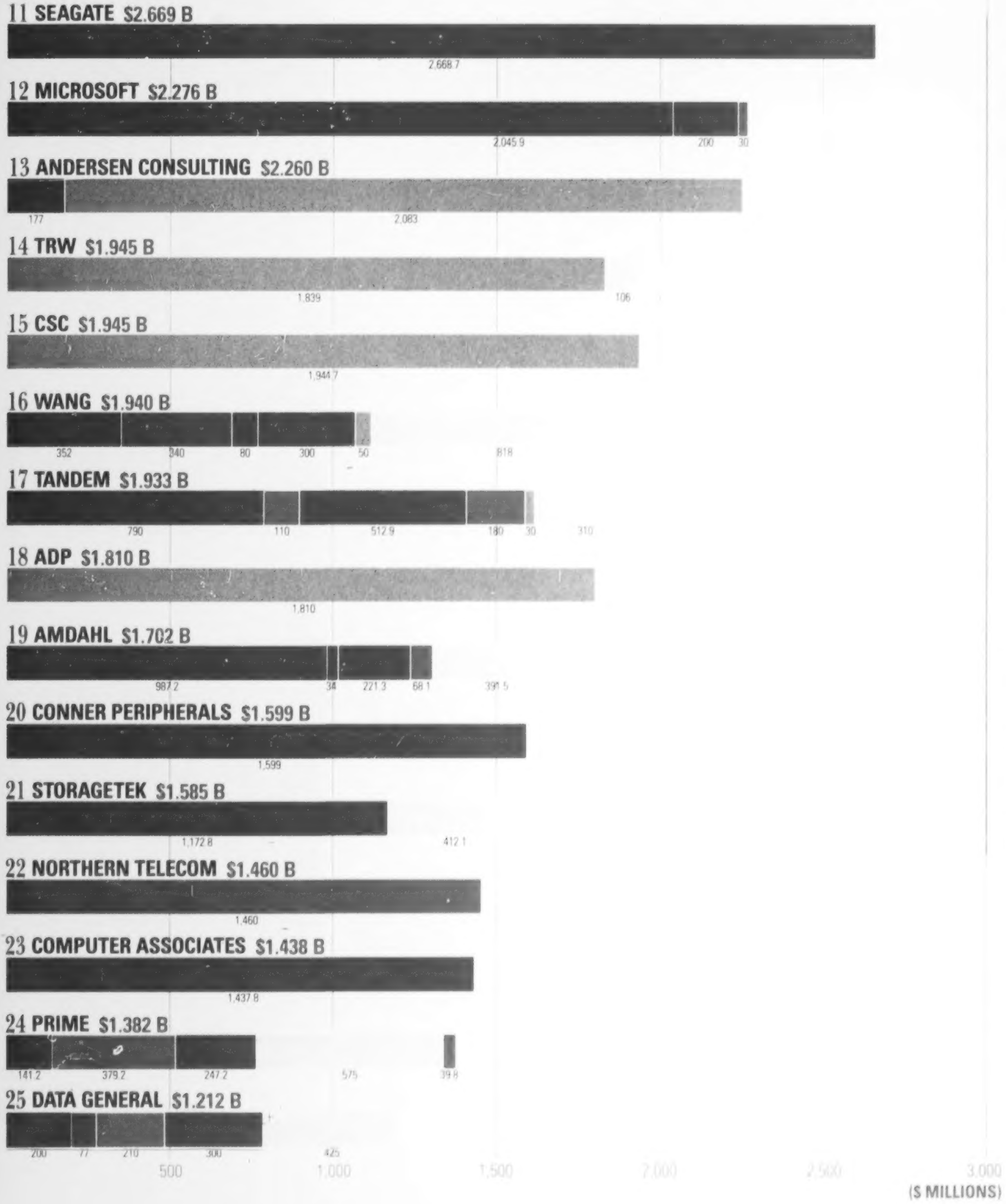
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12 MICROSOFT $2.276 B
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13 ANDERSEN CONSULTING $2.260 B
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14 TRW $1.945 B
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15 CSC $1.945 B
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16 WANG $1.940 B
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80
300
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818
17 TANDEM $1.933 B
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30
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18 ADP $1.810 B
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19 AMDAHL $1.702 B
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20 CONNER PERIPHERALS $1.599 B
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21 STORAGETEK $1.585 B
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22 NORTHERN TELECOM $1.460 B
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23 COMPUTER ASSOCIATES $1.438 B
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24 PRIME $1.382 B
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575
39.8
25 DATA GENERAL $1.212 B
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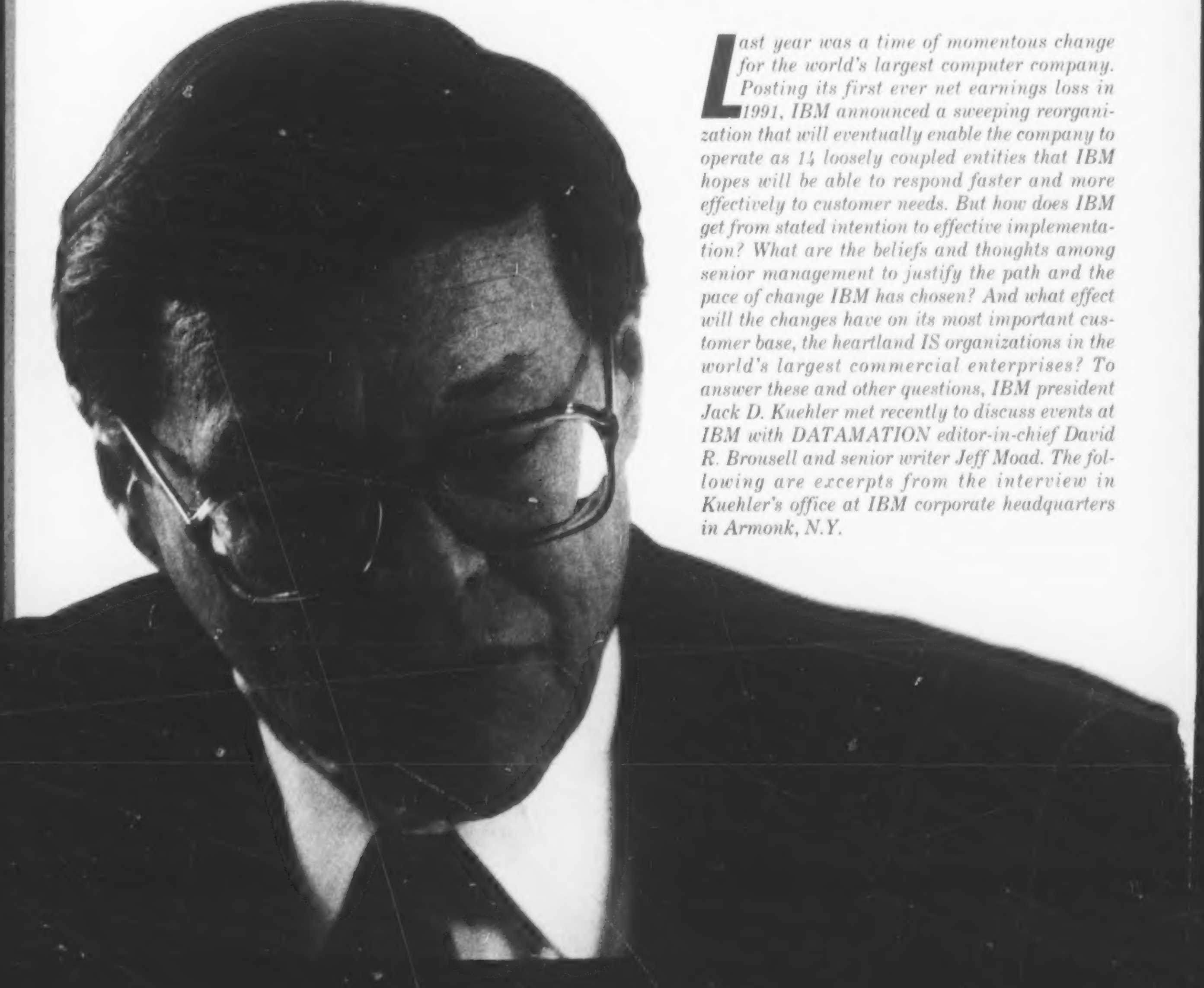
($ MILLIONS)

IBM's Kuehler:

We're Going To Be Different

The president of IBM discusses industry trends, Big Blue's reorganization, SAA and the PC business.



Last year was a time of momentous change for the world's largest computer company. Posting its first ever net earnings loss in 1991, IBM announced a sweeping reorganization that will eventually enable the company to operate as 14 loosely coupled entities that IBM hopes will be able to respond faster and more effectively to customer needs. But how does IBM get from stated intention to effective implementation? What are the beliefs and thoughts among senior management to justify the path and the pace of change IBM has chosen? And what effect will the changes have on its most important customer base, the heartland IS organizations in the world's largest commercial enterprises? To answer these and other questions, IBM president Jack D. Kuehler met recently to discuss events at IBM with DATAMATION editor-in-chief David R. Brousell and senior writer Jeff Moad. The following are excerpts from the interview in Kuehler's office at IBM corporate headquarters in Armonk, N.Y.

Q: *Do you believe there's a fundamental technological and economic model shift under way in the industry that's affecting IBM, or was 1991 just an aberration?*

A: I think what has been going on in the past in our industry is just continuing at a much faster pace. I don't have to tell you that my company and others in the industry are engaged in global competition. It's a well-used phrase, but it's really true. And what it means is thousands of competitors, rather than hundreds of competitors, for all of us. What that means is you don't have the luxury of delaying the [introduction] of your new technology to the marketplace because you're not the only game in town. There are thousands of other games. This you could describe as a shift. I would describe it as continuing evolution at a faster pace.

There is a lot of good business in front of us for our mainframe systems; defined as software.

Q: *The price per MIPS at the desktop is in the range of $1,000 now, whereas the price per MIPS at the mainframe is $40,000 to $50,000. Is this discrepancy between the perceived value of desktop and mainframe platforms a major hurdle that you've got to address?*

A: I don't agree with the delta that you have described of 40 versus 1....But I do agree there's a delta. And I do agree that there is a major set of factors causing our customers to take advantage of this new hardware and software opportunity called intelligent workstations....[But] when you think of mainframes, we talk in terms of 99% availability, 24 hours a day. And we think of thousands of workstations [that] sit there and do nothing for two shifts....

Although I think there are many more new applications being written for the intelligent workstation, there are also new applications being defined for what you call the mainframe. And those are as data servers in a large central database, as a server in a local area network, as the manager of a complex communications network....And our customers are telling us that they still require that software, which is what I think of when I think of mainframes, not the hardware. That complex software presiding over that set of resources....

So, to me it isn't an either/or. There is a lot of good business in front of us, we believe, for our mainframe systems, defined as the software.

Q: *So you're thinking of desktop technology as complementing rather than replacing the mainframe?*

A: I'm looking at it as complementary....[But] when I think of the mainframe, I don't think of the hardware. I think of the software enabling those resources to accomplish requirements that a customer has. And I would not be surprised if you didn't see workstation technology—hardware technology—over time become more and more of the underpinnings of that high-end software. There is nothing that says that you cannot accomplish the objectives of MVS/ESA with workstation technology....And we're working down that path.

Q: *The organizational changes you've made at IBM recently are in some ways dramatic. Some observers, however, say it's too little too late. Is it?*

A: I'm sure you can find somebody who has a different point of view on all bounds. We are very, very happy with the structural changes we've made. The changes inside of our company as a result of doing these are remarkable. And we have lots of customers' input that says we're on the right course and speed....

The real question is do we believe we're doing the right thing? We really do. This organization was driven personally by John Akers down the track of improving our responsiveness to customers in the marketplace, to speeding up decision making, to simplifying measurements, so that smaller organizations could really charge the mountain and achieve well-defined goals....And it's marvelous to watch what's happening. These businesses, for the first time I can recall, in some cases have said: "We have too many resources to meet our measurements. We are going to spend less capital." And, most importantly, [they] have given us plans where they intend to reduce their assets....The delegation of decision making is real. And I almost need to read the papers to find out what we're doing.

Q: *Some IS executives tell us they're concerned that, as IBM decentralizes, they'll lose their constant, unified interface to the company. Will that happen?*

A: That was one of John Akers's very strong considerations to retaining one sales force. In the past, IBM's had multiple forces. [Now] we have one. One in the U.S., one in Europe, etc., to maintain a consistent, common face to the customer. There'll be modest deviations from that. For example, our Pennant printer organization has a small, specialized sales force. But, by and large, John Akers wants to retain one face to the customer for that specific reason.

Q: *Under the new organization, will IBM's product groups continue to coordinate their activities? To what extent can IBM continue to enforce Systems Application Architecture, for example?*

A: Let me tell you what's happening. AdStar, the storage products organization...has realized that the IBM customer set is their largest customer and they [AdStar] need them [internal customers] to meet their objectives. Therefore, it's very important that they [AdStar] become unusually attentive to the personal systems team...so that the personal systems team won't go off and use somebody else's disk files....Their interface to their customers inside IBM has improved as a result of their belief that that's [their] biggest customer. It would be very foolish if they didn't satisfy them. So we're having, for now, the [desired] effect in terms of cooperation across the company....

SAA remains our principal focus to define the internal interfaces between MVS, VM, OS/400 and OS/2, as well as the interoperability across those platforms....We have an [SAA] organization that has not changed as a result of this reorganization under Dr. Mike Saranga. He and his teams are the architects. They work for Earl Wheeler, and they have two other teams, a total of...85 people whose role in life is to ensure that we maintain consistency and appropriate direction down that path.

Q: *So, do the lines of business have the option of being part of the SAA scheme or not?*

A: It's an option that they can decide to take. But there will be major visibility should they decide to take it, and it may very well be that that's one of the requirements that the management will now deal with, maintaining some consistency that's appropriate...a super empowerment over the empowerment of the individual organizations....[But] we haven't seen any—to my knowledge—people electing to take advantage of their newfound responsibilities and going south on SAA, because it offers advantages to their financial equation to remain a part of that.

Q: *What's IBM doing to improve the profitability of its PC business?*

A: One of the things that we're working on [is] to increase the turns. That's not something that we have had as a principal focus in years gone by....We're also redefining our distribution systems. A large part of the profitability opportunity is in how you distribute. We're also... redefining...higher priced models, lower priced models and, in Europe, we have a non-IBM-labeled set of products. So we can participate in the whole distribution system and deal with price pressures differently....And we're also refocusing on what we should develop for ourselves and what we should have others develop for us so that we can preserve our...expenses, our people, for the higher-value opportunities.

Q: *Is the reorganization leading IBM any closer to changing its no-layoff practice?*

A: The intent of this organizational concept is to provide a financial profile that achieves the objectives we [have] described....That's what we're all trying to do. How we get there will be defined day to day, as we go down the road. But we're going to get there.

Q: *For many years IBM has been seen as a symbol of American competitiveness, particularly against highly integrated global competitors. Will that continue to be true as IBM goes through the process of reorganizing into several autonomous business units?*

A: One of the foundations...of your questions is a healthy, strong company. It may change in terms of its makeup, but it must remain healthy and strong to provide the image you've described. And, not only the reorganizations but the other things we're doing [will keep IBM healthy and strong]. The alliances, the ability to share in the development of our technology and share in the capital as we've done with Siemens...that will allow us to continue spending at the rate necessary to remain the leader in DRAMs, which we've been for four generations. The ability to share in terms of creative people...that we are doing with the Apple alliance....The ability to share with Motorola in both the development and the manufacture of our RISC microprocessors....

I think, in fact, the IBM company...is larger and, we believe, stronger. And, therefore, that fundamental underpinning is going to get better, not worse....But we're going to be different....People say, "Will the IBM company change?" Would these same people have believed three years ago that we would have 40 Siemens engineers working in our top secret laboratories, designing in concert with us and manufacturing in concert with us our semiconductor processors and DRAMs? Would they have believed we would have had these alliances with Apple that we currently have? If you just step back and look at what we're doing, I challenge people to even ask the question, "Will IBM change?" We are changing. I hope you agree with that. ■

IS Revenue **$62.84 Billion**

NORTH AMERICA

1

INTERNATIONAL BUSINESS MACHINES CORP.

Old Orchard Road
Armonk, NY 10504
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They used to say that when IBM sneezes, the rest of the computer industry catches a cold.

The implication was that so pervasive was IBM's influence, the repercussions of even a minor problem at Big Blue would ripple throughout the industry. It also suggested that so robust was IBM that events which could bring its competitors to their knees would barely be felt in Armonk.

But you don't hear that old saying much anymore. That's because in 1991 IBM lost its patina of invincibility, along with any immunity it may once have had to forces like recession and fierce competition. In the wake of economic hard times, IBM became every bit as sick as any of its major competitors.

What's more, as large user organizations embraced concepts such as downsizing, open systems and client/server computing, IBM found itself no longer the single, centrifugal force in the information technology industry.

"For a few of our core applications, IBM is still the dominant player. They're still as critical as they ever were," says Jack Hancock, the chief information officer at Pacific Telesis Group in San Francisco. "But the issue of moving some applications off the mainframe and onto other platforms is very real. And, in that area, I just have a lot of alternatives to IBM. I believe that, for the first time, IBM management does understand that they've got an enormous problem on their hands."

If chief executive officer John F. Akers and company didn't understand that before, IBM's 1991 financial results certainly brought the point home. IBM reported its first-ever loss in 1991 and saw total corporate revenue decline by 6.1% to $64.79 billion. IBM's net loss of $564 million did not include a $2.263 billion charge for a required accounting change. Taken together, they brought IBM's 1991 total loss to $2.83 billion.

Lurking behind the bottom line numbers was more bad news. IBM's equipment sales—its fundamental hardware business—dropped 15.6% in 1991, with large-processor revenue dropping 9%. Personal computer revenue dropped even further. Revenue from what IBM calls personal systems—the PS/1, PS/2 and RS/6000—fell 11.8% in 1991. In fact, the PS line did even worse than that, since IBM has separately reported that RS/6000 revenues in 1991 rose by 60%. Revenue from IBM's usually strong storage business was also a weak spot, falling 19.9% from 1990 levels.

There were some bright spots for IBM in 1991. IBM's nonmaintenance services revenues were up a booming 34.5%, thanks to the company's successes in the growing outsourcing and systems integration markets.

Large-system revenue began to pick up late in the year, as IBM completed its transition to the new S/390 architecture with the shipment of its largest ES/9000 model 820 and 900 mainframes. Although IBM officials have stopped short of predicting double-digit mainframe revenue growth in 1992, enterprise systems general manager and corporate vice president Nicholas M. Donofrio has said IBM is sold out of ES/9000's into the second quarter of this year.

IBM's revenue from software also grew in 1991, although not as rapidly as in the past. Software revenue, at $10.5 billion, was up 5.7%. IBM's software revenue grew 18.1% in 1990.

But modest strength in its software, services and mainframe business was too little, too late for IBM. By early in 1992, the financial markets had reacted to IBM's awful year by stripping the company of its prized Moody's AAA credit rating and driving its stock price to a 10-year low.

CEO Akers reacted in the time-honored IBM fashion—he reorganized, creating eight product businesses and three service businesses, in December 1991, all acting relatively autonomously. The idea, according to Akers, was to free IBM's lines of businesses from the company's often stifling bureaucracy and to turn IBM into what he called "a network of more competitive businesses."

But Akers didn't stop there. After having publicly vented his rage over IBM's productivity problems, Akers placed many of the newly reorganized businesses in the hands of a set of relatively young (45- to 50-year-old) IBM executives. At the same time, he engineered the departure from the com-pany of several of his top lieutenants, more than one of whom, at one time or another, had been thought to be in line to become chairman. Among those leaving the company were top marketing chief George M. Conrades and senior vice president C. Michael Armstrong.

Akers also intensified what has amounted to a five-year effort at IBM to cut operating costs, primarily by reducing head count. Mainly through voluntary early retirement programs, IBM has cut its employee rolls by 62,604 since 1986. In 1991 alone, IBM trimmed 29,000 names from its payroll. That 7.8% cut reduced the staff to 344,396.

Costs related to its restructuring and downsizing resulted in a $3.4 billion one-time charge, which helped push IBM's 1991 financial results into the red. Before those charges and taxes, IBM had an operating profit of about $4 billion in 1991.

Some of IBM's largest customers have expressed mixed reactions to the organizational changes being forced on IBM. At this early date, they have seen little evidence that IBM's newly autonomous business units are responding more quickly with better new products. Rather, many worry that the new, "networked" IBM may become more difficult—and more expensive—to deal with. For example, customers such as Ben Parke, chief information officer at textile manufacturer Burlington Industries Inc., say that they're being asked to pay for support services that IBM had once provided free of charge.

"I don't like it, but I understand it," says Parke.

Other users worry that as IBM splits into autonomous entities they'll have to manage relationships with more than one IBM. "It's the same problem we faced back in the 1970s when IBM created the GSD [General Systems Division], and there were multiple sales groups. We don't want to see that again," says Pacific Telesis's Hancock.

IBM officials, however, insist the restructuring will make IBM more responsive and productive without sacrificing the company's relationship with its customers. IBM has taken care to retain a single sales organization so as to present a unified face to customers, IBM president Jack Kuehler told DATAMATION in a recent interview.

"This organization was driven personally by John Akers down the track of improving our responsiveness to customers in the marketplace, to speeding up decision-making, to simplifying measurements so that smaller organizations could really charge the mountain and achieve well-defined goals," says Kuehler. "We are very, very happy with the structural changes we've made."

Its organization wasn't the only thing IBM changed about the way it does business. In 1991, the company struck what for it were some unusual alliances. Big Blue strengthened its relationship with network kingpin Novell Inc., for example, and even entered into a broad-based product development relationship with longtime PC rival Apple Computer Inc., which could result in significant new desktop hardware and software technologies.

By the end of the year, there were signs that the cost cutting and a modest economic recovery were beginning to improve IBM's financial performance. The company reported revenues 3.3% and earnings 7%, higher in the first quarter of 1992 than they had been in the same quarter of 1991, excluding extraordinary charges.

IBM executives aren't assuming the company is suddenly out of the woods, however. IBM's disappointing 1991 results represent more than just a temporary, recession-related dip, and the changes at IBM so far are probably just the beginning. *—Jeff Moad*

IS Revenue **$14.24 Billion**

2 NORTH AMERICA

DIGITAL EQUIPMENT CORP.
146 Main Street
Maynard, MA 01754
(508)-897-5111

Digital Equipment Corp. executives would prefer to forget 1991. For the first time in its 35-year history, the Maynard, Mass., company suffered an operating loss: in its second 1992 fiscal quarter, which ended in December 1991, Digital lost $138.3 million on revenue of $3.47 billion. And although calendar year 1991 revenue grew 8.9% to $14.24 billion, a net loss of $864.4 million—most of it in planned restructuring charges—was a bitter pill to swallow.

Both Digital and its customers blame its poor showing on unnaturally low demand for its larger systems due to the poor economy. Says Bill Brindley, president of the loyal Digital user group DECUS: "If the economy had been surging and booming, I think Digital would have done very well."

Digital officials, however, also point to another factor: the growing tendency of customers to purchase so-called open systems and software and to the user community's perception that Digital sells proprietary solutions. Says vice president of corporate marketing Bill Johnson: "A perception existed around Digital as not being open....By and large, we were as open as anyone else, but the perception was what mattered."

Digital took several aggressive steps to alter that perception last year. It moved toward user-based, rather than system-based, software pricing. It encouraged its staff to be more open with customers. And it began shipments of open products such as a POSIX-compliant version of its VMS operating system. In February 1992, Digital gave proof to its claims of openness when officials announced it will license its VMS operating system, now called Open VMS, to other vendors.

At the same time, Digital took much-needed steps to compete in the high-stakes price/performance hardware contest. Not only did Digital announce one of the lowest-cost workstations in the industry, the $3,995 Personal DECstation 5000 model 20, but it also made a strategic commitment to the price/performance-sensitive PC local area network marketplace with new Intel 486-based PCs. It started a multivendor PC integration business unit and added robust capabilities, such as support for Novell NetWare, to its Pathworks LAN software products. Says Kevin O'Neill, an analyst with the Business Research Group in Newton, Mass.: "Digital recognized that PCs are not just attachments to the VAX, but are viable business systems [on their own]."

In fact, the company took a cue from successful PC mail-order vendor Dell Computer Corp. and founded its own Desktop Direct PC mail order program, which has spurred sales of its PCs.

Most important, however, Digital put its still-considerable muscle behind new 64-bit reduced instruction set computing chips and systems, code-named Alpha. At 200 megahertz, the first Alpha chip, the 21064, ran twice as fast as any other RISC processor on the market last year. Digital plans eventually to introduce Alpha-based systems ranging from palmtops to supercomputers. The systems will run not only VMS and OSF/1 but also Microsoft Corp.'s NT operating system, in a move designed to appeal to millions of existing DOS and Windows users.

Digital won't make the chips available in volume until late this summer and won't introduce Alpha systems until later in 1992. The company can't gain significant Alpha revenues until 1993 or even 1994, and thus, this year's financial performance is unlikely to change dramatically. And, while analysts laud the Desktop Direct program, low profit margins on PCs are unlikely to drag Digital out of its financial swamp.

In fact, Digital sank deeper into the financial abyss this year, announcing a shocking $294.1 million loss for the first quarter of calendar 1992, prompting analysts to forecast thousands more layoffs. Digital officials themselves say they don't expect financial performance to improve this year. Still, executives manage to convey high hopes that the next generation of technology will turn the company around. Says Johnson: "As a strategic product for the future, Alpha will be to Digital what the VAX was in the '80s."

—Elaine L. Appleton

IS Revenue $10.73 Billion

3

NORTH AMERICA

HEWLETT-PACKARD CO.
3000 Hanover Street
Palo Alto, CA 94304
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Unlike many of its competitors, Hewlett-Packard Co. emerged from 1991 on something of a roll.

In fact, thanks to continued strength in its desktop-printing and multiuser UNIX systems and the introduction last year of new, aggressively priced workstations, HP managed to increase its IS equipment and services revenues enough to overtake Unisys Corp. and become the third largest North American vendor.

Although the worldwide recession curtailed what in 1990 had been rapid HP revenue growth in Europe, the company managed to report a 12.7% increase in computer-related revenues to $10.73 billion for 1991. And overall corporate profits rose a healthy 11% to $856 million, a far cry from the previous year's 11% drop.

"We've now moved into the No. 3 position as a computer company....So now we can set our sights on No. 2," proclaims HP Computer Systems organization executive vice president Lew Platt.

Catching up with long-time rival Digital Equipment Corp. won't be easy. But the company did manage to continue its momentum into early 1992, growing computer revenues 17.8% and corporate net earnings by a surprising 49% in the first fiscal quarter, ending January 31.

Fueling HP's 1991 growth, as it has for several years, was the company's desktop printer business. HP started shipping its new LaserJet III in volume early in 1991, and already the product has captured a 75% market share, according to the La Jolla, Calif.-market research firm Computer Intelligence.

The multiuser UNIX business also continues to be a winner for HP. Platt says revenues from those products grew over 50% in 1991, following a 60% growth rate in 1990. Strong price/performance derived from improvements in HP's reduced instruction set computing (RISC) processor, plus industrywide interest in UNIX, has helped attract new users such as ITT Sheraton Corp., which is building a $14 million reservations and property management system around the HP 9000 series 800 UNIX midrange system.

Key new product moves helped HP stem market share losses it had been suffering in the UNIX workstation business. HP jumped to the front of the workstation pack in March 1991 when it introduced the HP Apollo 9000 series 700 workstations and servers, which offered an eye-popping price/performance of $1,000 per SPECmark. The announcement prompted key ISVs such as electronic design automation software vendor Cadence Design Systems Inc. and Lotus Development Corp. to announce plans to port their applications to the new HP workstations.

HP also made a successful push in 1991 to have several of its key products and technologies adopted as emerging industry standards. Many of the object management technologies pioneered in HP's NewWave graphical user interface were adopted as standards by the Object Management Group in 1991. And HP had similar success with its OpenView UNIX network management and Softbench CASE-integration technologies. Late in 1991, HP even moved to bring its proprietary MPE minicomputer operating system into the open systems world with a POSIX shell, which ships this month.

Going into 1992, HP's goals were little changed from those of a year earlier: improve overall financial results, achieve market share leadership in workstations and multiuser UNIX systems and push to have HP technologies adopted as standards. HP will also continue to squeeze better performance out of its PA-RISC architecture, Platt says. In addition to applying that increased power to its workstation line, HP plans to introduce larger symmetric-multiprocessing versions of its MPE/iX and multiuser UNIX systems, moving well into the mainframe performance area. As HP does so, Platt says, the company recognizes it will have to focus on developing technologies and service offerings that will allow it to coexist with mainframes.*—Jeff Moad*

IS Revenue **$8.17 Billion**

4

NORTH AMERICA

AMERICAN TELEPHONE AND TELEGRAPH CO.

550 Madison Avenue
New York, NY 10022
(212)-605-5500

After years of failed attempts to establish itself as a computer industry heavyweight, AT&T finally completed its protracted takeover of NCR Corp. last September. In a deal worth $7.4 billion in AT&T stock, the telecommunications giant ended NCR's 107-year tradition as an independent supplier.

Critics who once predicted that AT&T's acquisition would be the kiss of death for NCR were somewhat muted last year. Long before the merger paperwork was completed in September, both companies made it perfectly clear who would be in charge of AT&T's computer business—NCR. "We are essentially running this computer business 100%, and have been since September of last year," says NCR chairman and chief executive officer Gilbert P. Williamson.

DATAMATION estimates AT&T/NCR's total IS revenue at $8.17 billion for 1991. Computer revenue under NCR's control totaled $6.34 billion and IS revenue still under AT&T's domain (primarily PBXs and modem revenues from its Paradyne subsidiary) is estimated at $1.83 billion.

Despite time devoted to the merger, AT&T and NCR managed to hammer together logical product families, launch new products and sign big contracts throughout the year. Among the significant events were the following:

■ In March, Wal-Mart Stores Inc. agreed to buy NCR servers for use in over 800 retail stores.

■ In April, AT&T announced that it was selling off equity in its UNIX System Laboratories Inc. (USL) subsidiary, in a move that analysts say is meant to stem user defection to the Open Software Foundation's OSF/1 environment. By the end of the year, the company says, it had divested itself of some 20 to 30% of USL to 11 computer industry investors in a private placement.

■ Also in April, NCR rolled out its Document Management System (DMS) enterprisewide imaging system, based upon the company's multiple microprocessor System 3000 family.

■ In May, NCR announced its most powerful system to date, the mainframe-class NCR System 3600.

■ In October, AT&T's post-merger network plans became better understood after NCR released a new set of products in support of its Open Networking Environment (ONE), the first product announcement from the combined company.

■ In December, database server company Teradata Corp. agreed to merge into AT&T. Ranked 78th on the 1991 DATAMATION North American 100, Teradata had joined with NCR in the development of its System 3000 family. Both companies decided to continue evolving their current product lines until 1993, when customers from both will be migrated to the forthcoming NCR System 3700.

Unfortunately, not everything went according to plan. After NCR's flagship System 3600 was announced in May, NCR pulled it back into the labs, having discovered some software glitches. As a result, the first sale didn't occur until this January, when a savings bank in Spain placed the first order. Williamson believes the delay resulted in financial slippage for NCR last year. "This six-month slip [in delivering the 3600] means that the ramp-up of deliveries is also six months later. When you move out your revenue plan by six months, it's going to have a significant impact," he says.

Another embarrassing incident followed last summer's glitzy launch of NCR's 3125 pen-based system in New York City. After claiming it would be the first to ship such a system, NCR stumbled when the machine failed to be qualified by the Federal Communications Commission. The problem was finally solved well into 1992, but by then, major competitors were getting their systems out the door, too.

With NCR's System 3000 family now fully in place, AT&T is looking to this year and next to make a real impact on the computer industry. As potential customers warm up to the idea of scalable, multiprocessor-based systems as possible mainframe replacements, it may have its best shot ever at success.—*Paul Pinella*

IS Revenue **$8.00 Billion**

5

NORTH AMERICA

UNISYS CORP.

Township Line and Union Meeting Roads
Blue Bell, PA 19422
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For Unisys Corp., the long winter of its discontent may be ending.

The company's surprise fourth-quarter profit of $80.5 million and its statement that it expects to be profitable for all of 1992, although on lower revenues, was the best news the company has had for several years. Since 1989, the big-computer maker, shouldering an enormous debt burden, has been bleeding profusely, losing a combined total of more than $1 billion in 1989 and 1990.

Even though Unisys lost an additional $1.4 billion overall in 1991, the fourth-quarter profit marked the beginning of what everyone at the company hopes is a sustainable turnaround. Financial analysts hope for the same thing, but also see challenges.

"At some point, by late '92 when the cost cutting levels off, it will be incumbent on Unisys to show moderate revenue growth or they're back in the soup again," says Stephen R. Weber, managing partner at the Cowen & Co. research house in Boston.

The need to restart revenue growth, which Unisys officials say they expect to do in 1993, follows a tough 1991, when Unisys literally overhauled itself to raise enough money to meet its debt obligations and refocus its development and marketing efforts on its core markets.

In June, Unisys sold its Timeplex Inc. communications division to Swiss telecommunications firm Ascom Holding AG for $207 million. In July, the company announced a dramatic series of actions to reduce its costs and took a $1.2 billion charge to do so. The write-off included $925 million for what will amount to the reduction of 10,000 jobs by the middle of this year. That will reduce overall employment to 57,000 this year, less than half what it was when Burroughs Corp. and Sperry Corp. merged to form Unisys in 1986. The sum also includes $275 million in a write-down of good will.

Unisys last year announced the closing of its Flemington, N.J., workstation-engineering and manufacturing plant; a check-processing equipment plant in Scotland; a mainframe-manufacturing plant in Clear Lake, Iowa; a semiconductor wafer-forging operation in Rancho Bernardo, Calif.; and a circuit board manufacturing operation in Salt Lake City. Overall, the company removed 20,000 items from its product catalog and also announced that it was capping its V Series mainframes.

The restructuring and asset sales, combined with recessionary and other pressures, resulted in a 14% corporate revenue decline to $8.7 billion in 1991.

As part of its omnibus July announcement, Unisys refocused its global marketing strategy on four industry segments: financial services, airlines, communications and the public sector. "You just don't win a customer unless you provide a solution," explains chairman and chief executive James A. Unruh. "The technology alone isn't sufficient."

Meanwhile, as the structural and financial picture played out, Unisys managers were busy on the product side of the house, and Unruh reengineered the company's management team. Unisys introduced new high-end models in the A Series and 2200 mainframe lines last year, the A 19 and the 2200/900, and it committed to standardizing on Intel-based workstations and servers.

In March, Unruh promoted Reto Braun, who had been an executive vice president of corporate marketing, to president and chief operating officer. In May, Unruh promoted Hugh Lynch, who joined Unisys from NCR Corp. in 1990, to executive vice president and president of the Computer Systems Product Group. And in July, he brought in William B. Patton Jr., former president and chief executive of MAI Basic Four Inc. and chairman of Parallan Computer Inc., to be senior vice president and head of U.S. Information Systems.

In the midst of all the changes, Unisys stepped up a quality improvement program, training some 25,000 employees by year's end. The program produced what Unruh says are "extremely good" marks from customers. "Customer satisfaction ratings have been rising steadily as we've been going through all this," says Unruh. "We've been hammering away at it continuously."

And the company seems to have gotten through to some key users. Tom Murphy, president of the user group Use Inc. and director of the large systems support department at the Navy Computer and Telecommunications Station in Newport, R.I., says he's encouraged by the changes at Unisys, in particular the financial improvement. "I expected them to pull out, and they did—they justified my optimism," says Murphy, who oversees the station's 2200 computers. "They've always had the technology. In restructuring, they did what the computer industry had to do, and they did it first."

—David R. Brousell

IS Revenue **$6.50 Billion**

6

NORTH AMERICA

APPLE COMPUTER INC.

20525 Mariani Avenue
Cupertino, CA 95014
(408)-996-1010

During 1991, Apple Computer Inc. resolutely carried out its plan to sacrifice gross margins for market share. Overall, the company succeeded handsomely, increasing total revenues by 13% to $6.50 billion, while net earnings dropped 35% to $325 million.

But Apple's most surprising move of the year was the announcement of a long-term alliance with IBM, with the immediate goal of improved Macintosh-to-IBM networking through new products and cross-licensing agreements. This promptly bore fruit in the form of Token Ring and Integrated Services Digital Network (ISDN) cards and communications products to connect Macs to IBM's Systems Network Architecture (SNA) environment. And Apple executive vice president and chief financial officer Joseph Graziano says that "a whole suite of products is being developed." The next phase will be a line of Macintoshes powered by IBM's reduced instruction set computing-based PowerPC chips and an open-systems environment called PowerOpen (blending both Macintosh and IBM AIX software), due by the end of 1993.

Two joint ventures were also established last year between Big Blue and Apple: Kaleida Inc., focused on multimedia technologies; and Taligent Inc., focused on creating a completely object-oriented software development environment.

While slashing prices to keep up its market share, Apple did not sacrifice research and development funding, which continued to the tune of $574 million for 1991, about 9% of total revenues.

Maintaining that level of R&D resulted in, among other things, the 68040-based high-performance Quadra

Macintoshes, which were introduced last year at a price far more competitive than those of premium high-end Macs of the past. Also debuted was the 68030-powered Classic II compact Mac, which combines the CPU, monitor and keyboard all in one shell.

And Apple shipped the long-awaited System 7 operating system—fortunately with few bugs. Mac peripherals introduced in 1991 included low- and high-end laser printers and an ink jet printer, a scanner and a 21-inch color display. But Apple chairman and chief executive officer John Sculley singles out the PowerBook line of notebook computers, introduced last fall, as a major contributor to profits. He says 200,000 were sold by the end of March 1992.

In spring 1992 Apple brought out its first products aimed squarely at IBM PC users. These include a laser printer compatible with Hewlett-Packard Co.'s LaserJet, a scanner with software that runs under Microsoft Windows and two Windows products from Apple subsidiary Claris Corp.: Hollywood, a presentation graphics package; and FileMaker Pro 2.0, based on the successful Macintosh database manager of the same name. Many more Claris Windows applications are promised.

Organizational changes were made in 1991 to better position the company to serve corporate customers. Apple transformed its geography-based sales operation into a market-sector-based one, including a sales and service unit that focuses exclusively on large businesses and institutions.

The marketing move was matched on the product side by the creation of the new Enterprise Systems Division, headed by 18-year IBM R&D manager Morris Taradalsky. And Apple has published its Virtually Integrated Technical Architecture Lifecycle (VITAL)—a huge document that provides a platform-independent framework for constructing distributed multivendor information systems, based on Apple's own IS operation.

Graziano admits that Apple "must do a better job of integrating Macintoshes with the DOS environment," starting with IBM-Macintosh networking. "A whole suite of products is [already] being developed," he says.

Apple is pursuing consumers as it pursues IS. "As part of the reorganization of the company we set up a division around the personal electronic devices John Sculley has been talking about, to get a clear focus," says Graziano. These will be produced by both Apple and licensees. The first products are promised sometime this year, along with a line of consumer-oriented multimedia computers.

Graziano's bottom line for 1992: "gaining even more market share, with Apple in a leadership position as a technology driver. We can't do that with single-digit market share, and we have set our sights on more than 20%."—*Lee Thé*

IS Revenue **$3.67 Billion**

7

NORTH AMERICA

ELECTRONIC DATA SYSTEMS CORP.
7171 Forest Lane
Dallas, TX 75230
(214)-604-6000

Hard economic times are not necessarily hard for everyone. For some companies, in fact, they represent an opportunity.

That was certainly true for systems integration and outsourcing leader Electronic Data Systems Corp., which continued to report record revenues, earnings and backlog in 1991 despite—perhaps even because of—economic uncertainty.

"In good times, people have bought from us because...they wanted to expand. In bad times, people buy from us because they want to watch every penny and make sure they're delivering the best value to the customer," says EDS senior vice president Gary Fernandes.

EDS's revenues, excluding those garnered from its parent company, General Motors Corp., grew a booming 27.7% in 1991 to $3.67 billion. GM-related revenue was up about 11% to $3.43 billion, bringing EDS's total revenues in 1991 to $7.1 billion, up 16% over 1990's level. EDS's net earnings grew 10.2% to $547.5 million, including an accounting change adjustment.

With the spurt in non-GM activity, more than half of EDS's business came from outside its parent company for the first time since EDS was acquired by GM in 1984.

EDS in 1991 was able to exploit both the continuing trend toward outsourcing among IT users and its own reputation as an experienced outsourcing and facilities management provider.

EDS enjoyed success in its traditional markets such as health care, and it continued to push into newer areas like finance, manufacturing and transportation. Among major deals signed in 1991 were an $800 million contract to salvage Blue Cross & Blue Shield of Massachusetts's troubled claims-processing system and operate it over a 10-year period; a $2.1 billion agreement to take over all IT services for Continental Airlines Holdings Inc. and its System One reservation system; a major systems integration project for Signet Banking Corp.; and a 10-year facilities and systems management contract with automotive parts manufacturer PPG Industries Inc.

EDS also made a couple of key acquisitions aimed at increasing the company's global presence, as well as its business from computer-aided design systems. EDS's business has traditionally been heavily dependent on the U.S. market. In fact, in 1991, 80% of its revenues came from the

United States. In a bid to become more global, EDS in 1991 acquired SD-Scicon U.K. Ltd., a U.K. systems integrator, and its GFI Informatique French systems management and consulting subsidiary. Adding in Scicon's results will increase international revenue from 20% in 1991 to between 25 and 28% of EDS's total this year.

EDS's move into design systems consisted of the company's acquisition of the McDonnell Douglas Systems Integration Co. in November. Along with 2,000 MDSI employees, EDS got the company's key Unigraphics computer-aided design and manufacturing product line. EDS paid an estimated $250 million to $300 million for MDSI.

Last year was the year EDS began to participate in another popular IT trend: the move toward client/server computing. The company signed its first major contract to provide desktop-computing services and maintenance. The deal with General Electric Co. is valued at $500 million over a five-year period.

Fernandes predicts the GE contract is the first of what will be many desktop-oriented deals, as EDS attempts to move from its traditional mainframe technology base. To prepare for that, EDS has been testing the performance of client/server products and modeling the economics of shifting from host-based to client/server platforms.

"People feel it should cost less," says Fernandes. "But the reality is this client/server environment is a very complicated business."

Resolving the complexities of client/server computing for customers may eventually lead to big growth opportunities for EDS, Fernandes believes.

In the meantime, the company's short-term outlook isn't too shabby. Although EDS's GM-related business should be flat in 1992, Fernandes believes non-GM revenues should grow at least by 20% per year for the foreseeable future.—*Jeff Moad*

IS Revenue 8 $3.45 Billion
NORTH AMERICA

SUN MICROSYSTEMS INC.
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Mountain View, CA 94043
(415)-960-1300

What can you say about a company that increases revenue by 25% and profits by 32% in a recession year?

Closing out its first decade of business in style, workstation and server vendor Sun Microsystems Inc. was a bright spot in a gloomy business climate, with revenues of $3.45 billion and net earnings of $199 million. Still, recognizing that no one can afford to sit still, Sun made significant changes to its management structure and kept the new products rolling. Whether these moves will be enough to dampen the headlong rush of competitors remains to be seen, since although revenues increased 25% in 1991, they had increased more, 34%, the previous year.

In July, Sun officially lost its start-up look by reorganizing into five operating companies. They are:

- Sun Microsystems Computer Corp., for workstations and servers based on Sun's Scalable Processor Architecture (SPARC) reduced instruction set computing (RISC) processor;
- SunExpress, for nonsystem SPARC products, such as Intel-based workstations;
- Sun Microsystems Laboratories Inc., for research and development of new products and long-range planning;
- SunSoft Inc., which offers UNIX software for SPARC and other volume platforms;
- Sun Technology Enterprises Inc., for value-added software and hardware.

The company refuses to disclose profits or losses by group, but it does say SunSoft and Sun Technology should each contribute $100 million and SunExpress $170 million in revenues in their first year.

Although the vast majority of sales still are from hardware, Sun clearly is positioning itself for a relatively more software-oriented future. "We want prejudiced advocates for technologies that would have been subsumed and lost within the Sun Microsystems of a year ago," says Thomas Meredith, vice president and treasurer.

Although analysts say that software won't contribute much to earnings until 1993, the evidence is here already that software is taking on a new commercial, and more PC-based, look at Sun. In September, SunSoft unveiled the UNIX-based Solaris, which it dubbed the "first shrink-wrapped distributed-computing environment." Solaris 1.0 was available immediately for SPARC systems, but version 2.0, which will run on both SPARC and Intel X86-based systems, represents the first move into the non-SPARC arena. Both 2.0 versions are due to be generally available in mid-1992. To further underscore its new commitment to the Intel platform, in January 1992 Sun completed its acquisition of Interactive Systems Corp.'s Intel-based UNIX business.

To better understand Sun's strategy one need only look at the hardware market. Sun's bread and butter continues to be workstations, but it's facing heavy competition from Digital Equipment Corp., Hewlett-Packard Co. and IBM, all of which produce chips that are similar to or surpass Sun's SPARC line in performance. One of the most striking signs that Sun no longer owns the workstation market was Computervision's decision in early 1992 to end its Sun-only policy and incorporate HP hardware into its systems as well.

Sun received a sales boost in September when it announced its high-end SPARCserver 600MP series. In the last quarter of 1991, it sold 2,600 600MP units, a number Meredith terms "extremely heartening."

Servers make up less than 10% of all units sold by Sun (approximately 200,000 total hardware units were shipped in 1991), but their high price tags make them important to the revenue stream. On the workstation side, Sun announced in July the SPARCstation IPX, a midrange color desktop system, and the entry-level SPARCstation ELC.

In the meanwhile, Sun continues to be one of the leanest and meanest companies in the business. With approximately 12,400 employees, it generates an impressive $278,600 per employee. The call for the future is to generate $10 billion in sales with 15,000 workers, which would work out to $666,666 per person. While it's doubtful Sun can achieve that goal, the company has proved remarkably adept at rewriting the way an industry does business.

—Susan Kerr

IS Revenue $3.27 Billion

9

NORTH AMERICA

COMPAQ COMPUTER CORP.
20555 State Highway 249
Houston, TX 77070
(713)-370-0670

For nine years, champagne corks were popped whenever sales figures were released. But the champagne remained on ice at Compaq Computer Corp. last year. In the third quarter, sales took a dive, along with profits. The end result? The first major change in leadership since the company was founded in 1982. The founder himself, in fact, president and chief executive officer Joseph R. (Rod) Canion, was sent packing by the board of directors, replaced by Eckhard Pfeiffer, who had been chief operating officer.

That third-quarter $70.3 million loss was caused by the PC firm's first layoffs, as the company cut 1,400 employees and took a $135 million charge in the process. In all, Compaq took in 9% less in 1991 than it did in 1990, as revenues slipped to $3.27 billion. Net earnings plummeted 71%, dropping from $455 million in 1990 to only $131 million last year.

The steady diet of bad news was followed by some slices of humble pie, as Compaq executives were forced to admit that smaller, more agile PC manufacturers had, in effect, done to Compaq what Compaq had done to IBM. "What was a strategy that was successful in the 1980s is simply not a successful strategy in the 1990s," says Kevin Boren, vice president of marketing for Compaq's systems division.

So Pfeiffer began streamlining operations and rethinking many of Compaq's entrenched ideas. And few ideas were more entrenched than the company's dogged dependence on its dealers as its sole distribution channel. Pfeiffer signed up Merisel Corp. and Tech Data Corp. to sell Compaq products to specialized resellers. Andersen Consulting and Electronic Data Systems Corp. have also been authorized to sell Compaq products as part of their systems integration deals. At the low end of the market, Compaq authorized Tandy Corp. to sell selected Compaq models in their new Computer City Superstores chain.

In conjunction with these changes in its distribution strategy, Compaq opened a customer support center, both for its dealers and customers, in April of 1991. By April of this year, the support center was logging thousands of calls a day, not only for its own hardware but also for network operating systems and selected software products. Further bolstering its support offerings, Compaq signed two third-party service providers, General Electric Co.'s computer service division and TRW Inc.'s customer service group, to handle on-site service.

The company's products also got a face-lift last year. Just before his ouster, Canion oversaw the release of a new line of modular PCs, the DeskPRO/M line, and a new "Lite" version of the company's SystemPRO line of servers. Both have been well received by customers, analysts say. The company also introduced a color portable 486 PC aimed at a niche market, orders for which have exceeded expectations, company officials report.

Compaq cut prices on all of its products during 1991, as the company moved closer to head-to-head competition with the likes of AST Research Inc. and Dell Computer Corp. To enable it to cut those costs—and still show a good return on sales—the company is systematically overhauling its design and manufacturing operations to allow greater flexibility in pricing. For example, its new line of DeskPRO/M modular PCs and its new SystemPRO machines share common parts.

Internationally, Compaq continued to rack up good sales, as overseas dollars accounted for 59% of the company's revenue. During 1991, the company expanded its presence in Japan and Latin America. But Compaq is now facing its chief competitor overseas as well; Dell has established a strong beachhead in Europe.

Early this year, Compaq ended its investment in Silicon Graphics Inc., and with it, plans for the two firms to share graphics technology. Compaq itself continues to be at the center of rumors regarding acquisition by another high-tech firm. The rumors are continually denied by Compaq officials, but it's doubtful they'll stop until the champagne starts flowing again.

—Bob Francis

IS Revenue $2.93 Billion

10

NORTH AMERICA

XEROX CORP.
800 Long Ridge Road
Stamford, CT 06904
(203)-968-3000

Although Xerox Corp. introduced several innovative products in 1991, including a color printer to jump-start the young color-printing market, the new wares didn't help Xerox avoid less-than-vibrant financial performance.

Executive vice president of operations Wayland R. Hicks admits resignedly that the company's essentially flat performance last year was only "OK." DATAMATION estimates that Xerox's IT revenues improved nearly 5% to $2.93 billion, but total revenues declined a slight 0.8% to $17.8 billion. And while net earnings dropped 8.6% to $454 million, that caused far less pain than Xerox felt the previous year, when earnings plummeted 65% due to extraordinary charges.

Company officials blame Xerox's pedestrian performance on lackluster sales of its larger copiers and printers, which they say slowed as a result of the poor economy. Poor economy or no, however, having had its fill of flat earnings, management shook up the company this year. Chief executive officer Paul Allaire in March 1992 broke Xerox's document-processing business into nine product and service divisions, most of which have what the company calls "end-to-end" responsibility for manufacturing through sales.

The reorganization is an effort to rev "the clock speed of the organization," says Hicks. Of the previous structure, he says, "decisions had to rise higher in the organization than you would like, to get resolution. The higher you have to go, the longer it takes to get resolved....We had turf issues." The result? "All this caused us to do things slower than we would have liked to," he says.

Not only is the reorganization designed to help the company speed products to market, it's also intended to help Xerox reduce its high administrative costs by increasing efficiency. Last year, the company took a $175 million charge to pay for costs associated with reducing its work force by 2,500 people, a process that Hicks expects to be complete by year's end. Work-force reductions are nothing new to Xerox, which has shrunk its employee pool by 20,000 people since 1980 to the 100,000 where it now stands. Hicks predicts that although production volumes will grow throughout the decade, the work force won't.

Although Xerox faced numerous challenges last year, all of the news from Stamford was certainly not bleak. Boston-based Cowen & Co. managing director Steve Weber reports that more than 60% of Xerox's revenue is recurring, coming from maintenance, supplies, finance and rental income. On the product side, in September, Xerox introduced five new printers, ranging in speeds from 11 to 135 pages per minute. Analysts lauded each of them for technical innovation. Such a diversity of printers is a bit of a departure for Xerox. The company dominates the market for mainframe-class printers, but in the desktop and network printer market, has landed few punches against powerhouse Hewlett-Packard Co.

In other good news, the company's Docutech Production Publisher—a high-volume printer that also includes scanning and copying facilities—met sales expectations, mostly selling as a digital replacement to offset printers. However, Xerox didn't produce a less expensive version of the six-figure machine, which it had originally promised for 1992.

Still, with new products in place, continued expense paring and a determination to lead in the hot-growth market for color printing and copying, analysts forecast a turnaround. For Xerox, the future should get a whole lot brighter.—*Elaine L. Appleton*

IS Revenue $2.67 Billion

11

NORTH AMERICA

SEAGATE TECHNOLOGY
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Scotts Valley, CA 95067
(408)-438-6550

Excess manufacturing capacity caught up with storage vendor Seagate Technology, as the company's long-held high-volume production strategy ran out of steam in 1991.

Revenues for the calendar year held steady at $2.67 billion, maintaining Seagate's position as the largest independent storage producer. But idle factories, coupled with steep operating costs led to an expensive $15.8 million restructuring charge. That contributed mightily to turning 1990's $99.7 million profit into a 1991 $11 million net loss, which sent company heads spinning.

Among the casualties was president and chief operating officer Tom Mitchell, the premier proponent of the volume-marketing approach. After Mitchell's departure in September, chief executive officer and founder Alan Shugart reasserted his role in managing the organization, refocusing the company from volume commodity products to those that can justify a higher profit margin.

"Instead of trying to architect products that justify high-volume production, Shugart will try to target new drives at a specific customer base, bring them to market quickly and price them to ensure that Seagate sees a return," says Alexa McCloughan, vice president of storage research at International Data Corp. Margins matter more than volume in tight markets, she says.

She and other Seagate watchers in the industry think the company is now back on track. Shugart's new strategy paid off for the first time late last year with the introduction of the Seagate 1480, a 425-megabyte, 3.5-inch drive targeted at the workstation and minicomputer markets. Although competitors Conner Peripherals Inc. and Quantum Corp. promised similar products with higher capacities, industry demand was ripe, and Seagate got there first. According to McCloughan, Seagate is outselling Conner, its closest competitor in this niche, by more than two to one.

For many, the Seagate name remains synonymous with PC disk drives, and Shugart claims a revival of the desktop PC market helped turn the company's fortunes around in the final quarter of 1991. David Zalante, vice president of systems research at IDC, agrees. "Affordable high-end PCs helped Seagate navigate some choppy water," he says.

Still, as storage prices plummet and higher areal densities gobble research and development dollars, increasing demand for desktop storage hasn't taken any of the heat off Seagate. The company's 2.5-inch drives for laptops and notebook computers demonstrated little sales get up and go, as well-timed offerings from Conner Peripherals and Quantum dominated last year's boomlet in portable computing. By the time Seagate arrived on the low-end notebook scene, the mobile computer market had decided to sit down and take a rest.

Nonetheless, Zalante thinks Seagate is poised to regain lost ground in 1992. "Few storage companies can claim Seagate's technology resources—the manufacturing capacity, the chemists and the physicists who really understand head and media technologies," says Zalante. "And Seagate is just beginning to leverage some of the controller technologies it gained from the purchase of Imprimis [Technology Inc.] two years ago," he adds.

Shugart believes better management of Seagate's resources is his key challenge for 1992. "This is a tough, cyclical business; ups and downs are hard to predict," he says. "You've got to know when to reduce capacity and when to take reserves." The constant threat of competition from Japanese giants, like Fujitsu Ltd. and Toshiba Corp. (not to mention U.S. heavyweights like Hewlett-Packard Co. and IBM), which can allocate manufacturing capacity at a moment's notice, makes scaling back Seagate's own infrastructure a risky proposition.

—Don Marks

IS Revenue 12 $2.28 Billion
NORTH AMERICA

MICROSOFT CORP.
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Redmond, WA 98052
(206)-882-8080

The success of Windows created a major new application software category, and Microsoft Corp. was ready in 1991 to take advantage of it.

The results were impressive: revenue up an expansive 53.8% to $2.28 billion and net earnings soaring 63.5% to $581.4 million.

Major 1991 introductions included MS-DOS 5 and Visual Basic, followed this spring by Microsoft C/C++ 7.0, its first object-oriented language. The forte of both languages lies in developing applications for the Windows graphical user interface. And DOS 5, which can run with Windows, aids memory management.

By year's end, Microsoft sold more than 9 million copies of Windows—and that was without the help of the still-under-development Windows 3.1 and Windows NT. Windows 3.1 rolled out in April 1992 to critical acclaim—and in seven languages at once, in deference to the 56% of Microsoft revenues that come from abroad.

For the new release of Windows, says chairman and chief executive officer William H. Gates, "more than 50% of Windows's code was changed; installation, usability, and speed are all worlds apart [from Windows 3.0]." He goes on to promise the 32-bit fault tolerant Windows NT by December—probably.

Microsoft's applications division accounted for the majority of total revenue—51% for fiscal 1991, 3% more than it had the previous year. That gain came at the expense of the system software and language division. The applications division's success rests more and more on its suite of Windows products, which numbered a dozen at year end. The Excel spreadsheet was updated last winter and this spring. Perhaps even more important was a major revision to Word For Windows last October, which was received with general critical acclaim.

Gates has said the company's first database product, code-named Cirrus, should ship by the end of this year. Meanwhile, Microsoft is in the process of acquiring Fox Software Inc.—both its programming team and its Foxbase line of dBase-compatible database products. This should let it lock horns with Borland International Inc.'s coming dBase and Paradox For Windows products.

In the midst of all this activity, Gates took the time to revise Microsoft's top management structure this February, eliminating president Michael R. Hallman's position in favor of a team of top executives from the main divisions. "We went from having two people work for me to having five people work for me," says Gates. "There are now four levels of management from me to the developers," adds Gates, "or none—with e-mail."

—Lee Thé

IS Revenue 13 $2.26 Billion
NORTH AMERICA

ANDERSEN CONSULTING
69 West Washington Street
Chicago, IL 60602
(312)-580-0069

Andersen Consulting has been helping *Fortune* 1,000 firms set up new computer systems since 1954, when the firm installed the world's first commercial computer application for the General Electric Co. Since then, of course, commercial computing has been through a few changes. And Andersen has been changing right along with it.

In 1989, for example, the consulting group's parent, the accounting firm of Arthur Andersen & Co., spun off the consulting operation into an independent business.

The spin-off seems to have paid off; Andersen Consulting's revenue surged in 1990, from an estimated $1.22 billion when it was part of the accounting group in 1989, to a revised $1.88 billion. That adds up to an astounding 54.1% growth. Andersen's 25,000 employees at its 145 worldwide offices were even busier last year, when revenue grew by another 20.2% to $2.26 billion, squarely within managing partner George T. Shaheen's expectations of 15 to 30% revenue growth for last year.

This year, says Shaheen, Andersen is changing its strategy to help customers manage what the firm sees as a sea change under way in commercial computing. "We grew up in this business as systems builders. We've carved out a role for ourselves as the premier systems integrator in the commercial marketplace. But this year we'll be reaching for a higher plane. This year, we will be offering more than just systems integration services—we will be providing business integration services."

Shaheen defines business integration, in contrast to systems integration, as implementing information technology in all areas of business management, including strategic, operational and financial sectors.

"We're combining technologies, strategies and organizations with changes in business process at our clients, many of whom are literally reinventing themselves as business operations," says Shaheen.

And the instrument for business integration at a growing number of Andersen's clients is client/server technology. About half of Andersen's customers today are developing new client/server implementations, says Shaheen, and about 70% of the new business coming in is for client/server systems.

Andersen's new client/server development products available as part of its Foundation computer-aided software engineering (CASE) tool system may be one explanation for the increase in client/server business. Sales of the Foundation product line increased a heady 70% in 1991 to $100 million.

The company plans to ship Foundation For Cooperative Processing for UNIX platforms this year.

Not to be outdone by its own clients, Andersen is itself considering ways to reinvent itself in 1992. Shaheen points to Project Eagle, an internal project to transform its current product line and determine what entirely new products to develop and enhance over the next few years.—*J. William Semich*

IS Revenue 14 **$1.95 Billion**

NORTH AMERICA

TRW INC.
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Cleveland, OH 44124
(216)-291-7000

Ninety-year-old TRW Inc. showed many signs of strain in 1991. Sales were down, losses mounted up and the company seemed buckled under by the weight of too many noncomplementary businesses. So TRW executives decided that 1991 was the time to shape up and ship out those businesses that were dragging it down.

All three segments of TRW will be streamlined, including its Automotive Group and its Space & Defense Group. But the heaviest hand will fall upon the company's IS businesses. In December, TRW announced that, within the Information Systems & Services Group, it would divest itself of its real estate loan document-processing services, receivables management and computer maintenance units. The new core of TRW's IS&S group will now be consumer and business credit reporting, target marketing, real estate information and financial systems. (For ranking purposes, the DATAMATION 100 does not include credit-based revenue.)

In all, TRW incurred a $365 million charge in the fourth quarter of 1991 for restructuring; almost half, $181 million, was attributable to write-downs in information systems. That left the company with a year-end loss of $140 million on total corporate revenue of $7.9 billion compared with a profit of $208 million and revenue of $8.2 billion the previous year.

The IS&S group posted 5.0% revenue growth in 1991 to $1.95 billion. But it suffered a $138 million loss, whereas in 1990 it had earned a $49 million profit. Through attrition and layoffs, information systems-related employment at TRW dropped 10% to 14,695 workers last year. For 1992, the IS&S group is looking to reduce costs by $50 million.

Real estate loan services were a bright spot for the group. While the company will no longer handle loan document processing, it plans to keep and manage real estate data files. In the third quarter, TRW and Elsevier Realty Information Inc. formed a joint venture, TRW REDI Property Data, to provide real estate information services to 40,000 customers. That venture added about $10 million a quarter in sales. In other good news, the Financial Systems unit won a $25 million contract to build a multisite imaging system for the NMB Postbank Group of The Netherlands.

The best news for the company would be if it could sell its computer maintenance group, which has been on and off the selling block for more than a year. "We've been handicapped with the drag of the computer maintenance business," says Joseph T. Gorman, TRW's chairman and chief executive officer. TRW thought it had a buyer in 1991, but financing fell through. Company executives have given themselves 18 months to complete the corporate divestment project. If no takers are found by mid-1993 for all the businesses up for sale, executives will reevaluate the strategy and decide whether simply to close down the operations entirely.

On the corporate side, Edsel D. Dunford was promoted to president and chief operating officer. The 27-year TRW veteran had previously been executive vice president and general manager of the Space & Defense Group.—*Susan Kerr*

IS Revenue $1.94 Billion

NORTH AMERICA

15

COMPUTER SCIENCES CORP.

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El Segundo, CA 90245
(310)-615-0311

Computer Sciences Corp. tried valiantly in 1991 to broaden its systems integration business from its base in the government market to encompass more of the commercial sector. And the company pulled in nearly $4.7 billion in new business from both government and commercial customers last year. Many of the contracts are multiple-year orders, running as long as five, 10 and 12 years. That's the good news.

The bad news is that some of the new business, especially a $3 billion, 10-year order from General Dynamics Corp. to manage its aerospace and defense data centers, may be diluted by Defense Department cutbacks.

And early this spring, the company was smarting from allegations in connection with a $347 million five-year contract it had won in 1990 from the Environmental Protection Agency.

As part of an internal investigation of its own accounting practices, which may have left too much of the oversight for its contracts to the contractors themselves, the EPA alleged "serious deficiencies in accounting procedures" of CSC in relation to EPA contracts.

The publicity was widespread and damaging, and not only to Computer Sciences. The EPA incident was followed by a 10% drop in CSC stock, which had peaked at 84 at the end of February.

Analysts, meanwhile, caution that CSC could also be hurt by a proposed cutback in the Navy's Seawolf submarine program. CSC is designing the software for the submarine's advanced combat system. In addition, its contract with General Dynamics includes the management of the Norwich, Conn., data center that supports that company's Electric Boat division in Groton, Conn., the Seawolf contractor.

Through it all, CSC's revenue kept growing, rising another 15.8% to $1.94 billion, keeping pace with the previous year's revenue growth. But earnings dropped 3.7% to $65.5 million in 1991 after having risen 16% in the previous year, partly because of losses incurred in Europe.

In a move to strengthen its European operations, the company acquired Butler Cox PLC, an $18 million London-based management-consulting firm. It will be absorbed into Computer Sciences's consulting arm CSC Index Inc. in its European operations in Belgium, Germany, the Netherlands and the United Kingdom. CSC also acquired Moria Informatique, a systems integration and software firm based in Paris.

William R. Hoover, CSC's chairman and president, said the acquisitions represent a commitment "to build a truly global management-consulting firm with strong depth in information technology." He attributed last year's European losses to a "recessionary climate" in Europe.

Computer Sciences moved to strengthen its U.S. computer-consulting activities through the acquisition last year of Analytics Inc., CompuSource, Intelicom Solutions Corp. and Paragon Consulting Group (now Cleveland Consulting Associates).

At the end of the year, Alvin E. Nashman retired as head of CSC Systems Group. The Falls Church, Va., group has some 14,500 employees. Nashman will remain a member of the CSC board, a post he's held 24 years. The company early this year named James R. Mellor, president and chief executive officer of General Dynamics Corp., to its board, bringing total membership to nine.—*Tom McCusker*

IS Revenue $1.94 Billion

NORTH AMERICA

16

WANG LABORATORIES INC.

1 Industrial Avenue
Lowell, MA 01851
(508)-459-5000

What do you do when your company's core business gives way to new technologies and stronger competition?

Manage in innovative ways.

In word and deed, that's what chairman Richard W. Miller and his band of managers are doing at 41-year-old Wang Laboratories Inc. As in the case of its Massachusetts neighbors Data General Corp., Digital Equipment Corp. and Prime Computer Inc., Wang's technological stronghold of minicomputers is under siege by networked personal computers and workstations.

The battle, under way for some time, took its toll on Wang again in 1991. It lost $380 million on $1.94 billion in revenues. That's much less severe, however, than the $665 million in red ink that spilled across the company the previous year when sales totaled almost $2.4 billion.

Consider how exactly Miller & Co. responded under fire in 1991:

- Wang in essence became a value-added reseller for several products made by its biggest competitor, IBM, integrating, in some cases, Big Blue's products with its own brands.
- Wang backed away from some customer segments, such as manufacturing applications.
- Wang launched a clever attack on the biggest problem facing corporate computing users—lack of white-collar

productivity gains.

- Wang started selling personal computers in department stores and other mass merchandise channels.

"There is not another company in the computer industry that is modeled the way we are," says Miller. "Boeing is the best model I can point to. It doesn't make engines, but it is an excellent integrator of them. And Boeing provides world-class service."

Whether Miller's systems integration plans for Wang fly with customers remains to be determined. Only now are they beginning to see bona fide products appear from the Office 2000 blueprint Miller unveiled a year ago—office automation software and services that add value to the IBM RS/6000 midrange and IBM PS/2 desktop systems that Wang resells and to the VS midrange systems and Exec personal computers that it makes and markets.

When U.S. customers of Wang were surveyed by DATAMATION and Cowen & Co. earlier this year, before Wang executives embarked on a worldwide 11-city tour to brief IS managers on the company's office vision, these customers were decidedly down on the supplier. Only one out of four Wang customers who now use its products as their primary departmental systems intended to stay with Wang in the future, according to the survey. The United States accounts for 40% of Wang's business.

Despite this customer dissension, departmental applications remain Wang's primary focus. It's trying to sell professional, administrative and support systems for departments in financial services firms, insurance carriers, government agencies, health-care providers and legal firms. "Our success does not lie at the enterprise, backbone networking level, where we had been trying to compete," says David I. Goulden, vice president of Office 2000 Systems Marketing.

As part of the agreement with IBM, Wang's strategy is to help customers move off Wang's VS systems onto IBM's AS/400 machines. Why? The company doesn't want to lose the revenue stream from or the goodwill of customers whose applications—process control and retailing, for example—no longer fit Wang's core strategy of developing software and systems for the office. "We have the technologies and services to help them with the conversion [from VS to AS/400]," says Joseph M. Tucci, executive vice president of Wang.

The Wang and IBM alliance, announced a year ago, is paying off for Wang in a number of other ways. Besides giving Wang $25 million (a loan that Big Blue can convert into Wang stock at a later date), IBM lends stability to the company. "Sales of our VS systems have gone up since we made the IBM announcement because it gives our customers a safety valve," Tucci claims.

Wang's own research and development investments, which annually total more than $200 million—more than 10% of revenues—are split evenly between software for the RS/6000 platform and both software and hardware for the VS line of midrange systems and servers. Customers eager to see evidence of Wang's promise to continue enhancing the VS—still the company's chief revenue generator by far—by now should be deluged with technical documentation on three-dozen VS-related product introductions scheduled for this spring and summer. Notable among them is Mercury, the code name for Wang's VS 12000 high-end processor. Based on bipolar chip technology supplied by Hitachi Ltd., Mercury boasts 50% greater performance than its predecessor, the VS 10000.

Whether those products, Exec PCs sold through mass market retailers like Service Merchandise Co. Inc. and the IBM systems remarketed by Wang are enough to return the company to profitability in 1992 may rest more on global economic conditions than on any other single factor. "Europe is a bloodbath," Miller said in late January, addressing a region of the world that traditionally provides about a third of Wang's sales. "Economically, it's where the United States was nine months ago." Asia, however, remains a dynamic market for the company—generating upwards of 15% of Wang's revenues.

—*Tim Mead*

IS Revenue 17 **$1.93 Billion**
NORTH AMERICA

TANDEM COMPUTERS INC.

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It's been pretty obvious for some time now that Tandem Computers Inc. is no longer the high-flying quintessential growth company that it was in the late 1970s and most of the 1980s. By the end of 1991, management was forced by slowing revenues and abundant red ink to start sketching a new business model for Tandem as a more efficient, slower-growing vendor of highly reliable, on-line transaction-processing systems.

"Our management team's model was always oriented toward being able to sell and being customer oriented in good times," says Tandem president and chief executive officer James G. Treybig. "But the '90s aren't going to be good times. So we have to change that model and change how we think and act. We want to stay oriented toward customers, for sure. But we have to start being oriented toward processes that lead to productivity."

Helping Treybig and his team discover their new focus on efficiency and productivity was a $66.5 million 1991 loss that included a $98.1 million corporate-restructuring charge. Tandem's revenues for the year grew only 3.2% to $1.93 billion. That rate of growth was less than a third of what Tandem saw just a year earlier and a far cry from the company's

50%-plus go-go years.

The worldwide recession has certainly been a factor in Tandem's slowdown. But Treybig sees more fundamental reasons, as well. Customers are confused by the move to open systems and client/server computing. And, in tougher economic times, says Treybig, they're inclined to question the size of the bottom-line returns they've received from their massive investments in information technology. As a result, says Treybig, "I think we're, in some countries, in a period of reevaluation." Tandem's business has slowed in Japan and the United Kingdom, in particular.

Tandem is doing some reevaluation of its own. A first step came at the end of 1991 when Tandem announced restructuring plans expected to generate savings of up to $50 million in 1992 and up to $100 million in 1993. Those plans include a 9% reduction in staff by September 1992.

Tandem is also looking to become more efficient by improving certain key business processes such as marketing and software development. Tandem is focusing its marketing efforts on application areas like intelligent networking and payment systems that still have the potential for rapid growth.

Tandem invested directly in one such vertical application area in 1991 when it acquired from US West Inc. its Applied Communications Inc. subsidiary, which specializes in integrated banking systems. Another key market for Tandem has been telecommunications, where its Tandem Telecommunications Systems Inc. subsidiary helped increase the company's telecom revenues to 36% of the company's total in the fourth quarter. That compared with 25% for the previous year.

Tandem has also targeted companies engaged in bulk transaction processing, such as credit card and airline reservation processors. Forty percent of Tandem's business already comes from customers like Visa USA Inc., and Tandem hopes to increase that by offering those customers cheaper transactions through lower cost hardware. To that end, Tandem in 1991 replaced the midrange portion of its Cyclone and CLX product lines with fault-tolerant hardware based on reduced instruction set computing chips from Mips Computer Systems Inc. Price/performance for the new products, dubbed CLX/R and Cyclone/R, are as much as twice as great as for previous Cyclone and CLX products based on proprietary processors.

The new RISC-based products did not start shipping until late 1991 and early 1992. But already, Tandem says, initial orders are strong, and in the first quarter of this year, Tandem returned to profitability, reporting earnings of $8.8 million.

—Jeff Moad

IS Revenue **$1.81 Billion**

18

NORTH AMERICA

AUTOMATIC DATA PROCESSING INC.

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(201)-994-5000

The world's largest computer services company slogged through the recession last year, posting meager 4% growth in revenue to $1.81 billion and a modest 8.7% rise in net earnings to $239 million.

During the year, ADP's strategy for broadening product sets in its four core business segments took a back seat to recession-related priorities. "The greatest thing we're doing is managing to control costs, improve margins and improve products, and waiting for the economy to improve," says Arthur F. Weinbach, senior vice president for administration and finance. Three other factors affecting financial performance in 1991 were the continuation of a stock-repurchasing program (12 million shares since 1990); lower yields on investments, in particular, interest income; and continued pruning of noncore businesses, including certain batch-accounting services, network services and certain commodity quotation services.

Within ADP's core businesses, Employer Services—the traditional payroll-processing operation that at 58% of the company is ADP's oldest and largest business—grew in the 11 to 12% range in 1991. That was slower than ADP had anticipated. Layoffs at its customers' shops in the U.S. service industry cost ADP about 1% in revenue growth last year.

In Brokerage Services, which has been struggling to achieve growth for the last couple of years, ADP focused on bringing its cost structure down. As it did so, transaction volumes rose at its Wall Street customers in the second half of the year, driving revenue enough for brokerage services to break even.

Two new customers brought into the fold for the front-office services sector of the brokerage division in 1991 were The First Boston Corp. and Smith Barney, Harris Upham & Co. Inc. In a contract that will run six and a half years, Smith Barney plans to install more than 4,200 ADP FS Partner workstations, which are based on IBM PS/2 computers. First Boston ordered 600 FS Partner systems for its Equity Trading and Investment Banking departments.

Dealer Services, representing about 11% of ADP, chalked up 5 to 6% revenue growth last year, which chairman Weston believes was a fairly good performance given the considerable failure rate among automobile dealers in the last few years.

In February of this year, ADP signed a $50 million contract to resell Motorola's Delta series 8000 multiuser systems, which are based on the88000 RISC chip. In other Dealer product lines, ADP had by December installed 2,000 of its previously introduced HP-built LaserStations in car dealerships and had a 500-unit backlog going into 1992.

Automotive Claims, representing about 5% of ADP, enjoyed double-digit revenue growth. The company announced a joint venture with San Diego-based Mitchell International to develop a repair-estimating service for body shops. The goal of the venture is to get body shops to electronically standardize the way they prepare estimates to reduce disparities with those from insurance companies. ADP is also jointly developing with IBM and State Farm Mutual Automobile Insurance Co. what Weston described as a "tablet form" handheld device, equipped with the "equivalent of a zoom lens," that would enable insurance adjusters to input and process claims information.

On the acquisition front, ADP bought National Auto Data Service of Milwaukie, Ore., which provides vehicle replacement estimates primarily in the Northwest. Automotive Claims also signed renewal contracts with State Farm and Allstate Insurance Co., its two biggest customers.

Another development that potentially has longer term strategic consequences was the acquisition in January 1992 of Autonom, a Dusseldorf, Germany-based auto dealer services company with 1,000 clients and $20 million in revenue. This was the first non-U.S. acquisition ADP has made in several years, representing a change in strategy under Weston.

"I do not think that there's a priority for expansion in Germany," says Weinbach. "North America is still a greater return on management time. But international customers are looking for common technology and platforms. We could look for small acquisitions and inroads to lay a foundation for what may be an expansion opportunity in Europe in the latter half of the '90s. Directionally, the thinking is there."

—*David R. Brousell*

IS Revenue
19
NORTH AMERICA
$1.70 Billion

AMDAHL CORP.
1250 East Arques Avenue
Sunnyvale, CA 94088
(408)-746-6000

Searching for something positive to say about 1991, Amdahl Corp. chief financial officer Ed Thompson recently concluded, "It will be a great year to make comparisons against."

It certainly will be, assuming the plug-compatible mainframe vendor's business improves in 1992.

Amdahl, for the first time since it was founded in 1970, reported a net operating loss in a quarter, dropping $18.9 million in the final period of 1991. The loss, brought on by a combination of recession, sustained discounting in the mainframe market and Amdahl's own production problems, was accompanied by a 39.5% fourth-quarter revenue skid. The weak year-end result reduced Amdahl's net earnings by 97.6% to $4.4 million before an extraordinary tax credit of $6.2 million. Revenue for the year, at $1.70 billion, was down 21% from 1990's level.

Although Amdahl managed to ship about as many processors in North America in 1991 as it did in 1990, the company suffered from a weak European market and rampant discounting of mainframe prices worldwide. The discounts, which came as Amdahl and competitors Hitachi Data Systems Corp. and IBM engineered a transition to a new generation of mainframe products, helped reduce Amdahl's gross profit margin by 30.5% in 1991 to just 37.5%.

"Nineteen ninety one was a much more difficult year than we anticipated," understates president E. Joseph Zemke.

Amdahl did manage to meet its deadline for beginning production shipments of its new 5995M mainframe systems by year-end 1991. Analysts estimate that Amdahl actually shipped three of the 5995M three- and four-processor mainframe systems last year. The company expects to ship at least 150 of them by the end of 1992, Zemke says.

Amdahl's production problems carried over into 1992, however, when the company announced it would be unable to meet its second-quarter deadline for shipping the top-of-the-line six- and eight-processor versions of the new 5995Ms. Amdahl said testing problems related to a new automated console feature would delay initial shipments until the third quarter of this year.

Zemke says the delay won't affect Amdahl's 1992 revenue and earnings. The company will instead be able to ship more smaller systems early in the year, he explains. Early in 1992, Zemke predicted Amdahl would return to profitability in the first quarter of 1992, and he reported a record order backlog for 5995M systems entering 1992.

And in fact, Amdahl reported first-quarter 1992 revenues of $497.9 million, 12.5% higher than they were in the first quarter of 1991. Net earnings, although 61.6% off, were indeed in the black, at $4.39 million. Amdahl said production shipments of its new 5995M mainframes and 6390 disk drives helped revenues, although high manufacturing and testing costs associated with the new production hurt earnings.

The delay in shipping its high-end products, however, will make it harder for Amdahl to escape the competitive pricing pressure it's been facing. Bob Djurdjevic, president of Phoenix-based Annex Research, expects IBM to begin shipping its own eight-processor ES/9000 mainframe by the end of this year. "That will begin a whole new cycle of discounting at the high end," he predicts.

In the end, the best way for Amdahl to escape from the pricing pressures of the mainframe hardware business will be to exploit new software and service markets. That's exactly what the company began to do in 1991, introducing a significant new release of its UTS

UNIX-derived operating system, as well as a major new application development environment, dubbed Huron. Amdahl hopes to use those products to sell its commercial mainframe customers on moving to open systems software.

That will take time, however. Zemke says the $200 million in open systems revenues Amdahl pulled in in 1991 fell short of expectations. And, through the end of 1991, Amdahl had shipped Huron to only 20 customers, falling about a quarter behind its shipment target. While Amdahl is optimistic about both UTS and Huron for 1992, Zemke admits "it's too early to call either a success."—*Jeff Moad*

IS Revenue **$1.60 Billion**

NORTH AMERICA

20

CONNER PERIPHERALS INC.

3081 Zanker Road
San Jose, CA 95134
(408)-456-4500

You'd hardly know that the recession finally caught up with Conner Peripherals Inc. last year. Its 1991 revenues reached $1.60 billion, a 19.6% increase over the year before. Of the six major independent disk drive manufacturers, it did the best in terms of profitability, according to Moody's Investors Service Inc. And with a $600 million cash horde, it ended the year in the strongest financial position in its five-year history, according to Finis Conner, its chairman and chief executive officer.

While its revenues set another record, its earnings dropped for the first time, by 29% to $92.5 million—due, says Conner, to the "effects of worldwide recession." Nevertheless, the company remains a formidable player in the 3.5- and 2.5-inch disk drive business, holding a 90% market share in the 2.5-inch field, Moody's says.

Analysts attribute the company's remarkable performance to fast footwork, which is essential in the rapidly changing PC market. For example, while 2.5-inch disk drives contributed to Conner's strong performance for three quarters of last year, it led to a poor fourth quarter when the supply of notebook computers saturated the market much faster than anticipated.

To cope with change, Conner has moved fast. As the recession began to affect performance last year, it spun off its thin-film headstack operations in Malaysia to Read-Rite Corp., realizing $11 million in an exchange of stock. It acquired VISqUS Corp. in another stock swap that gives Conner possession of an advanced head-to-media interface technology. In January, Conner paid $9 million for a minor equity position in Sunward Technologies Inc., along with ownership of Sunward's patent for a new form of headstack assemblies.

This spring, Conner was issuing a debenture offering that would raise its cash hoard to $900 million to be used to diversify its business mix.

In May 1991, the company announced five new 2.5- and 3.5-inch hard disk drives, representing the fifth generation of products in Conner's five years. They included an 85-megabyte version of the 2.5-inch drives for Intel 80386- and 80486-based notebook computers. Conner followed this six months later with a 120MB version of the same product. In a product departure, Conner last fall introduced the Chinook, a dual actuator storage system aimed at intensive input/output environments. The dual actuator approach, which can handle up to 140 I/O functions per section, nearly doubles the performance of existing single actuator drives.

Conner does research, development and initial production in the United States and volume production in Asia and Europe. It has plants in Italy, Malaysia, Scotland and Singapore. Last year, it promoted William Watkins, 38, as president of its disk manufacturing division in San Jose.

—*Tom McCusker*

IS Revenue **$1.58 Billion**

NORTH AMERICA

21

STORAGE TECHNOLOGY CORP.

2270 South 88th Street
Louisville, CO 80028
(303)-673-5151

The poor economy and some determined competition notwithstanding, Storage Technology Corp. continued its steady climb up from its mid-1980s brush with Chapter 11. The midrange/mainframe storage company held firm in its strategy of introducing an aggressive stream of products in a number of markets and reestablishing its distribution channels to set the stage for the vigorous growth its management expects in the mid-1990s.

The 4400 Automated Cartridge System that fueled the bulk of 1990 sales continued to dominate its market in 1991, although not as completely as it had the previous year. StorageTek chief executive officer Ryal R. Poppa admits that other vendors entering the market such as Comparex Informations systeme GmbH, Memorex Telex Corp., Fujitsu Ltd. and Hitachi Ltd., are eroding StorageTek's market share. And he's concerned about IBM's imminent entry into the market. Still, Poppa claims that his company receives 95 of every 100 dollars spent on cartridge systems.

The value of an overwhelming market share has not been lost on StorageTek management StorageTek sales came predominantly from the 4400 and related tape cartridge products in 1991, accounting for 57% of revenue. Building on that momentum, the firm announced that it would introduce five products over the next three years to meet the needs of this growing market segment.

In November 1991 StorageTek completed the purchase of midrange systems distributor XL/Datacomp and in February 1992 moved to purchase Sweden-based distributor Edata Scandinavia AB. Both moves are intended to help rebuild distribution channels. StorageTek also announced a distribution agreement with Compagnie des Machines Bull and a technology agreement with Matsushita Electric Industrial Co. Ltd. to use a Panasonic helical-scan tape subsystem design for computer data storage. From this agreement, StorageTek expects by 1994 to produce a storage product called Redwood.

StorageTek's purchase of and financial merger with XL/Datacomp creates some confusion when looking at the company's financial performance. Officially, the firm expanded IS revenue for 1991 by a modest 2.6% to $1.58 billion in 1991. Official earnings look worse, growing by less than 1% to $93.1 million. These figures, however, combine the financial results of StorageTek with those of troubled XL/Datacomp. Viewed alone, StorageTek actually expanded revenues by about 10%, still shy of last year's 16% gain, and profits are up by more than 20%—impressive, but not near the 45% level enjoyed the previous year.

Still, the brighter picture is more indicative of where StorageTek stands at the moment.

Much of that positive outlook is due to Iceberg, the eagerly awaited disk storage system for mainframe users based on redundant arrays of inexpensive disks (RAID), which was officially announced in January 1992. First customer shipments are scheduled to start next month, and general availability is slated for November. Alpine, a RAID disk array system targeted at midrange systems, is also scheduled to begin shipping in the second half of this year.

As his company poises to begin shipping Iceberg disk arrays, Poppa is far from sanguine about present performance. "My whole focus is on the future," he says. "Starting in the second half of '92, we have a new product scheduled for every quarter through 1994. The big growth will be in '93 and beyond."—*Bill Sharp*

IS Revenue $1.46 Billion
22
NORTH AMERICA

NORTHERN TELECOM LTD.
3 Robert Speck Parkway
Mississauga, Ontario, Canada L4Z 3C8
(416)-897-9000

Northern Telecom Ltd. continues to distance itself from the computer business to focus almost exclusively on telecommunications equipment. It completed its acquisition of Britain's telecommunications giant STC PLC for $2.2 billion in March 1991. Shortly after, however, it was negotiating with unnamed companies to sell the 20% interest that STC held in British full-line computer maker ICL PLC. (The remaining stake is owned by Fujitsu Ltd.)

While it had no success as of late spring in divesting itself of ICL, it had immediate success in disposing of three other major assets—STC's electronics distribution, cable products and electrical equipment divisions.

The acquisition of STC, whose name was changed to Northern Telecom Europe Ltd., contributed significantly to the Canadian company's 21% rise in revenues to $8.18 billion in 1991. In fact, the company says its acquisition of STC made Northern Telecom the second largest designer and manufacturer of telecommunications equipment in North America, behind AT&T, and No. 3 in the world. DATAMATION estimates a 19.7% rise in IS revenues to $1.46 billion.

Nevertheless, the largest increase was in international sales, while U.S. and Canadian revenue advances were lower, due to the recession.

Dr. Paul G. Stern, chairman, president and chief executive officer, says another key to the company's growth was "the continued network modernization in many overseas countries." That modernization is reflected in healthy spending on research and development, which increased to $1.23 billion, or fully 15% of total revenue in 1991. It's also reflected in Northern Telecom's net earnings, which rose 7.9% to $496.5 million.

Early this winter, the company completed a 50-50 joint venture with Motorola Inc. into the cellular switching and radio market. It is one, according to John Roth, president of Northern Telecom's Wireless Systems Group, that is expected to generate $500 million in sales this year and $1 billion by 1994. He says the venture is aimed at shoring up each company's performance in the $1.6 billion North American cellular phone market. Analysts estimate Northern Telecom held a 7% share of the market in 1991, and Motorola held an estimated 23% share. AT&T is the leader with 38%, followed by Ericsson with 28%.

During 1991, the company started to make inroads to Eastern European and former Soviet Union telecommunications equipment markets. It has an order to supply $21 million of central office switching equipment to the republic of Azerbaijan. That will form the backbone of the republic's first digital network. In July, Northern Telecom received an order from the Polish telecommunications company to provide public-switching equipment that will be connected over the next five years to Poland's national telephone system. The order is valued at $120 million.

This summer, Northern Telecom's vice chairman for products and technology, David G. Vice, 58, will retire to spend more time with family and pursue community interests. Vice, who has been with the company 36 years, was a member of a recently formed four-person Executive Office, and was the company's president for five years.

—*Tom McCusker*

IS Revenue **$1.44 Billion**

23 NORTH AMERICA

COMPUTER ASSOCIATES INTERNATIONAL INC.

1 Computer Associates Plaza
Islandia, NY 11788
(516)-342-5224

No. 2 independent software vendor Computer Associates International Inc. surged out of a two-year period of retrenchment last year with a 9.7% rise in revenue to $1.44 billion, a new PC and UNIX product strategy and a clear direction for the decade.

Revenue had increased by a barely perceptible 1.6% in 1990 as CA struggled to digest the products, services and massive customer base that accompanied the previous year's purchase of Cullinet Software Inc. and Applied Data Research. Net earnings also increased respectably last year, up 6.8% to $173 million.

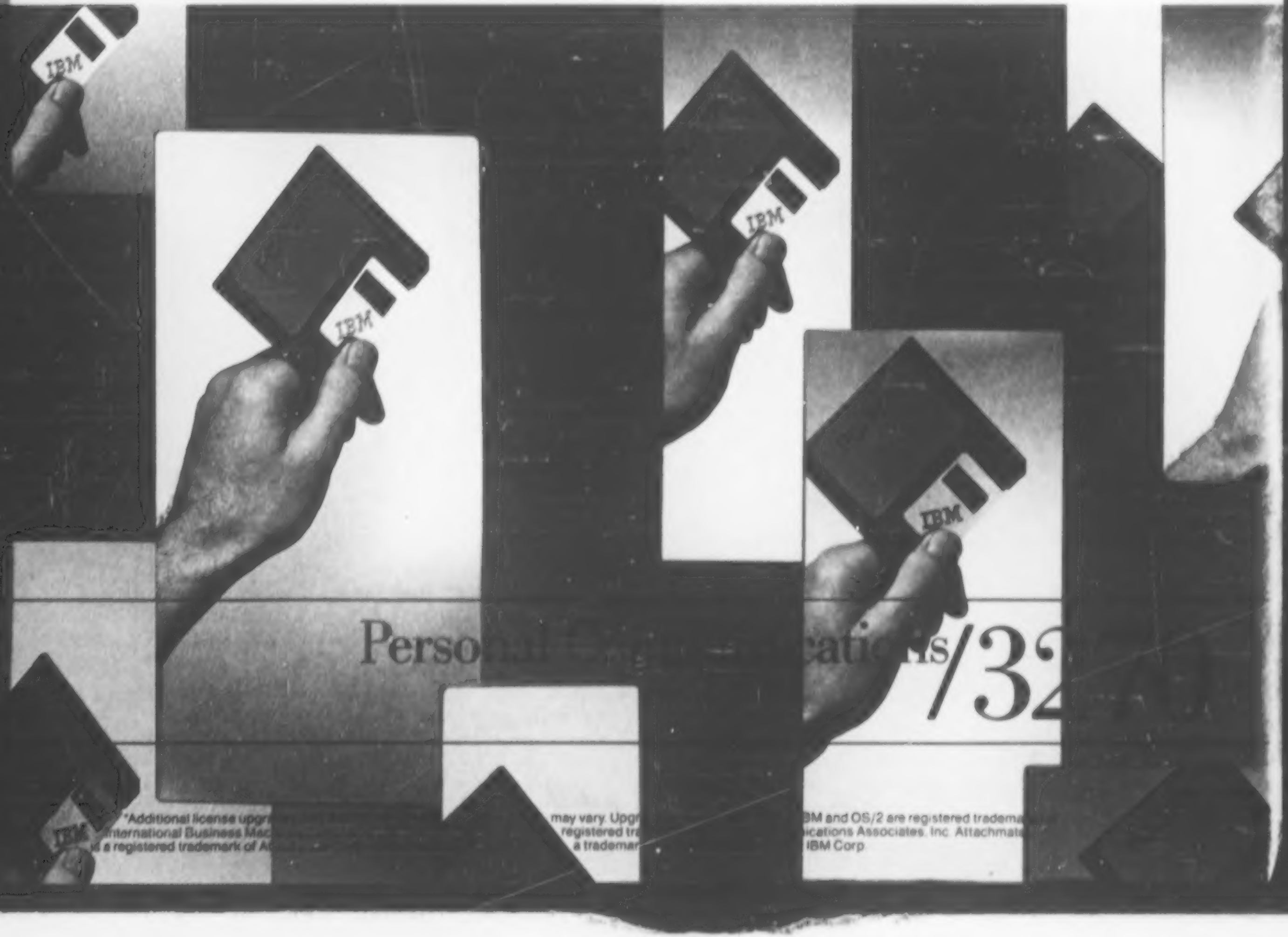
CA actually set the stage for the 1991 resurgence back in 1990 when the company made two critical strategic decisions. The first was to implement its CA90s strategy to integrate all of its 300-odd software products with each other and across diverse hardware and software platforms. The second was to broaden its product line to include commercial UNIX and PC LAN applications.

Although neither of those two decisions has been completely realized as yet, the company was able to harvest some early fruits last year. Says computer analyst Terence M. Quinn of Kidder, Peabody & Co. Inc. in New York City: "The perception that Computer Associates has few growth opportunities due to its predominance in the no-growth mainframe computer market is quickly becoming incorrect."

Add's CA chairman, president and chief executive officer Charles Wang: "we recognize that the marketplace has been changing dramatically since the advent of the PC. We've not done well on the PC platform in the past, but we've changed that now—and we've started to show that last year. Our biggest challenge for 1992 is to maintain that momentum."

Evidence from 1991: CA's nonmainframe revenue in the final quarter of 1991 constituted 25% of total revenue for the quarter. The previous year it accounted for less than 10%.

"This was primarily due to particularly strong sales in CA's PC software, primarily dBFast," says Quinn. DBFast is CA's new Windows-based dBase-III compatible database man-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agement and application development product. CA also launched its first UNIX database management system last year, CA/DB, and is partnering with Hewlett-Packard Co. to develop and market a group of UNIX software applications. The company launched the first of these, its new CA-Unicenter UNIX-based systems management products, early this year.

All that, combined with Wang's decision to take personal control of the company's new Micro Products Division and to boost corporate resources for PC development and marketing, has Quinn predicting that the company's nonmainframe revenue will reach 30 to 35% of total sales by the end of this year.

Of course, Wang still didn't let any good mainframe-based software company acquisitions go by last year. CA acquired On-Line Software International Inc., a vendor of tools and performance management software for IBM's Customer Information Control System (CICS) and DB2 database management system. It also bought Pansophic Systems Inc., a development tool and AS/400 manufacturing applications vendor, and Access Technology Inc., whose 20/20 product dominates the spreadsheet market on DEC VAX and other vendors' mainframes.

With the Pansophic acquisition, CA also picked up the COBOL compiler and CICS tool vendor Realia, which Pansophic had itself only recently acquired. "Realia is the gem in Pansophic's crown," says Wang, adding that the company has products that include "370 operating system emulation on a PC, CICS for the PC, DL/1 and IBM transparency for the PC, VSAM, COBOL—all of it. I'm very excited about that acquisition."

—*J. William Semich*

IS Revenue **$1.38 Billion**

24

NORTH AMERICA

PRIME COMPUTER INC.
100 Crosby Drive
Bedford, MA 01730
(617)-275-1800

Minis are going the way of the dinosaur, and Prime Computer Inc. is trying desperately not to go with them. Instead, it is trying to reinvent itself, and it's slow going. Last year proved just how long it might take.

Total corporate revenue was down 13% to $1.38 billion, and net earnings dissolved $16.9 million into the red, a far cry from the $56.4 million profit recorded in 1990.

Prime is also staring down a well of

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IBM

long-term debt that is $1.24 billion deep, and many are concerned about Prime's ability to repay those loans. In November, Standard & Poor's Corp. lowered its rating to C-- on the debt of Prime and DR Holdings Inc., Prime's parent company, and the not-so-white knight that rescued it from a forced takeover.

Nevertheless, the company is moving—away from its proprietary midrange systems and toward service and software.

In fact, it may be difficult to call Prime a minicomputer company anymore. Prime's midrange business only provided about 10%, or $141.2 million, of its revenues during 1991. Revenues for servers and workstations were more than twice as high, at $379.2 million. The largest percentage of Prime's revenues, some 41%, came from its maintenance and repair business. Software accounted for $247.2 million of its revenues, the bulk of it derived from its Computervision Business Unit, which develops and sells computer-aided design and manufacturing (CAD/CAM) software.

These figures reflect an ongoing shift in products for Prime. As part of that strategy, in August 1991 Prime announced that it would phase out its 50 series minicomputers over a five-year period and encourage customers to move over to its UNIX-based EXL systems.

To make itself over, Prime has cut staff, forced others to take unpaid vacations and reorganized. In the spring of last year, Prime announced it would reduce staff by 800, about 11% of its work force. At the end of the summer, Prime merged its manufacturing operation back into its Computer Systems Unit and reorganized its executive ranks. In the fall, Prime announced it would lay off an additional 900 employees. According to Prime, attrition accounted for most of the spring cuts, but layoffs were the order of business in the fall. The Computer Systems and International units were the hardest hit.

Prime might also be trying a new approach. Early this year, it arranged a deal with Hewlett-Packard Co. that seems to echo the deal Wang cut with IBM. The agreement calls for Prime to buy and resell $400 million worth of HP 9000 systems and Apollo workstations over three and a half years.

—Elizabeth Lindholm

IS Revenue **$1.21 Billion**

25

NORTH AMERICA

DATA GENERAL CORP.
4400 Computer Drive
Westborough, MA 01580
(508)-366-8911

Well, it was nice while it lasted. Data General Corp. returned to profitability in 1991 and stayed there throughout the year, only to announce in quick succession this April a layoff of 1,000 workers (12% of its work force) and a loss of $55.3 million for the first quarter of 1992.

And it was a great ride. Although DG's revenue dipped 2% to $1.21 billion for 1991, its profits reached $77.2 million, a far cry from the $106.9 million loss posted the year before, not to mention the four preceding years of red ink. Chairman and chief executive officer Ronald L. Skates is generally credited with turning the company around through aggressive cost-cutting measures and a strategy based on the company's AViiON workstations and servers and on the Eclipse MV line of minicomputers.

Over the past two years, Data General has cut its staff in half, to about 8,100. This spring's round of layoffs reduced that number by 12%. Along with the layoffs, Data General consolidated operations and sold its Fountain, Colo., and Clayton, N.C., manufacturing facilities.

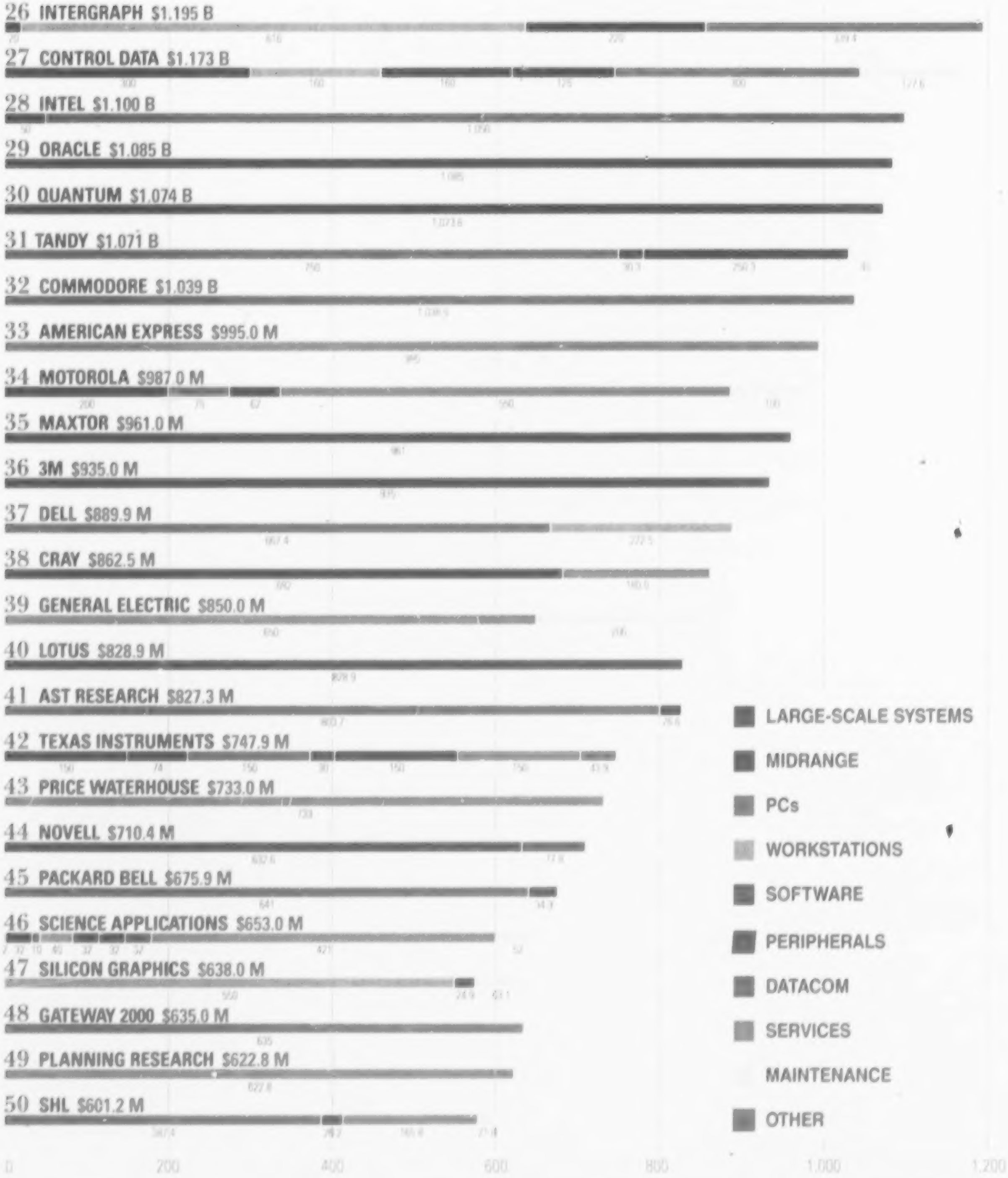
As Skates was holding the line on costs, the AViiON line of computers saw tremendous growth. Revenue from the line exceeded $200 million in fiscal 1991—double that of a year ago. Data General expects that to continue. "AViiON has consistently grown from quarter to quarter," says Stephen P. Baxter, Data General's vice president of corporate marketing. "It has grown in the market segments we said we were going to go after, and we continue to see that across the board on a worldwide basis." Baxter adds that most of those AViiON sales have been high-end servers—and most have gone to new customers.

And the AViiON was not the only system that saw growth in 1991. Baxter says that DG sold $100 million worth of Eclipse systems to new customers. Data General introduced four new models to the line last year, and in April of this year introduced the sixth generation of its Eclipse minis.

Landing some large contracts also helped. The company estimates that its multiyear contract with the Environmental Protection Agency for AViiON servers will generate revenues of up to $100 million. A contract with the Maryland Procurement Office of the federal government is valued at more than $40 million. DG also inked a deal with Petroleos Mexicanos (PEMEX), Mexico's national oil company, for Eclipse MV and AViiON systems and Dasher PCs.

Baxter acknowledges the importance of desktop machines, but sees the server as the glue that will hold the 1990s computing architecture together for most users. DG's ability to offer PCs is, in his view, just a little extra icing.

Whether Data General can regain and then sustain the momentum of 1991 is a question many want answered. Most ($48 million) of the $55.3 million first-quarter loss is the result of its layoffs. How well Data General does will depend in large measure on how well the AViiON servers do. *—Elizabeth Lindholm*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PERIPHERALS
DATACOM
SERVICES
MAINTENANCE
OTHER

IS Revenue $1.20 Billion
26
NORTH AMERICA

INTERGRAPH CORP.
1 Industrial Park
Huntsville, AL 35894
(205)-730-2000

There is a lot for a person to like in the recent past of Intergraph Corp., maker of niche technical workstations and software—such as the way Intergraph won the Navsea Navy deal, for instance. The Navy signed a $362 million, multiyear, extendable contract with Intergraph to use its systems in oceangoing ship design. Intergraph calls it the largest-ever contract for computer-aided design and manufacturing (CAD/CAM), and the Alabama firm won in the face of tough competition from Computervision and Sun Microsystems Inc.

And then there's Intergraph's purchase early in 1991 of electronic design automation (EDA) vendor Daisy/Cadnetix Inc. (which it renamed Dazix-Intergraph Inc.) Dazix, combined with Intergraph's own EDA sales, made a solid contribution to revenues and earnings in 1991 while broadening the user base of Intergraph software. This increase in software revenue, which Intergraph estimates at 19.5% of total revenue, makes Intergraph less hardware dependent and thus less susceptible to the downward slide of hardware margins.

With all this, somehow analysts expected more from Intergraph last year than 14.4% revenue growth. Revenue for 1991 reached $1.20 billion. Earnings increased by 13.6% to $71.1 million. San Jose-based Dataquest Inc. notes that subtracting Dazix revenues from the corporate total leaves just 6% revenue growth. "One would have expected some growth even with just the purchase [of Dazix]," sniffs Harvey Allison, vice president of Alex. Brown & Sons Inc.

Intergraph treasurer Jim Dorton does his best to place the results in perspective. He points out that the introduction of competing workstations from Digital Equipment Corp. and Hewlett-Packard Co., and anticipation of IBM's introduction in early 1992 of its low-end RS/6000, forced Intergraph to talk about its own new systems sooner than it would have liked, and earlier than it could deliver them. Intergraph's C400 reduced instruction set computing UNIX workstations and servers, which provide three to six times the performance of previous models, were accordingly introduced in 1991, but did not begin shipping until this spring.

Meanwhile, Dorton suggests, Germany—Intergraph's strongest selling ground in Europe—got so caught up in reunification that users there delayed purchases. International revenue was 46%, down 7% from 1990.

Even more damaging was a slowdown in U.S. government purchases due to nerves in the face of a sluggish economy. Dorton says that government purchases account for 15% of its total sales, so the purchasing pause caused particular pain.

But Intergraph is nothing if not creative. Analysts rank the Dazix portion of the firm as the No. 3 EDA vendor and expect it to perform well as software offerings from its two families are fully melded. Intergraph last year moved to broaden the appeal of its low-end MicroStation software by porting it to Hewlett-Packard's series 700 workstations. The firm also began actively marketing its own systems integration services, moving into another area where margins remain solid.

Intergraph chief executive officer Jim Meadlock retains some strong admirers, such as Kathryn Hale, senior CAD/CAM analyst for Dataquest, who sees the wisdom of not engaging in the commodity end of the workstation market and instead staying firmly in its high-end niche, waiting for growth to come. "Meadlock has resisted the short-term views of Wall Street," she says. "He is building a company that will be worth something in five years, not just producing quarterly profits. Other CEOs could take a lesson from him." *—Bill Sharp*

IS Revenue $1.17 Billion
27
NORTH AMERICA

CONTROL DATA CORP.
8100 34th Avenue South
Bloomington, MN 55425
(612)-853-8100

The self-inflicted wounds of the 1980s were supposed to be healed by now, but Control Data Corp. still hasn't made a complete recovery. Indeed, the patient suffered a setback in 1991 as the global recession caught the firm in the midst of a difficult change from proprietary mainframes to open systems.

A net loss of $9.8 million for the year after a profit of $2.7 million in 1990, and a 9.8% contraction in total corporate revenues to $1.52 billion, prompted Control Data to seek a waiver on loan covenants with its lenders until a scheduled debt renegotiation at the end of the first quarter of 1992.

In September, the company announced a major restructuring intended to launch its main businesses—computer products, information services (the Arbitron TV rating service, administration of state lotteries) and government computer services—as separate legal entities to more readily attract equity investment and partners.

Against that backdrop, the Computer Products Group turned in a creditable performance in difficult times (revenues were flat at $647.8 million), and demonstrated with new products and support for its mainframe customers that it has defined its future. In fact, after two years of negative growth, CDC's total IS revenues are estimated by DATA-

MATION to be up 4.5% in 1991 to $1.17 billion.

"The strategy is in place to go to open systems," says James E. Ousley, president of the Computer Products Group. In fact, he adds, the transition occurred much faster than expected in 1991, challenging sales and support staff to keep up.

It also accelerated the onset of lower margins (40% versus at least 60% for proprietary systems), meaning "we have to sell more open systems to pick up the slack and produce the same earnings," Ousley says. Last year wasn't a good year for that, he adds, "and we missed our objectives."

Central to a successful migration to open systems is CDC's InfoServer 4000 UNIX line of information servers, introduced at the beginning of 1990. The latest and most powerful, unveiled last October, is the mainframe-class 4680, based on the R6000 chip from Mips Computer Systems Inc. The research firm Dataquest Inc. regards that as vital to CDC's future, stressing that, with the 4680, and in particular because of the 64-bit emitter-coupled logic (ECL) R6000 chip, "Control Data, for the first time in years, has within its grasp an edge that potentially will reverberate for years to come."

That's what Ousley hopes. He claims that CDC has sold more than 1,000 of the 4000 series; CDC's revenue from open systems topped $150 million in 1991, double that of 1990 and a long way from the zero open systems revenues of 1989. He expects another increase of 80 to 100% in 1992.

While the 4000 series is generating new customers, the CYBER-compatible machines are also finding favor with CDC's existing base of 1,400 mainframe users worldwide, who operate more than 1,700 CYBER mainframes and 3,000 workstations.

Keeping those customers happy is a priority, and CDC seems to be succeeding, according to Carolyn Gard, president of the user group VIM Inc. "The biggest concern of proprietary users was CDC's transition to open systems, but the company is very conscious of that issue," she says. "It has separate vice presidents for each, so no one's feeling left out."

—John Morris

IS Revenue **$1.10 Billion**

28

NORTH AMERICA

INTEL CORP.

2200 Mission College Boulevard
Santa Clara, CA 95054
(408)-765-8080

Intel Corp.'s dominance of the microprocessor marketplace—never open to serious question—took on whole new proportions in 1991. Faced with a worldwide recession and battling competitors that were cloning its most popular chips, Intel shrugged and turned in its best financial performance ever.

The company's revenue rose 22% in 1991 to $4.78 billion, while net earnings rose 26% to $819 million. In the process, Intel displaced Motorola Inc. as the largest U.S. semiconductor supplier, as ranked by Dataquest Inc. according to worldwide sales.

DATAMATION estimates that 23%, or $1.10 billion, of Intel's 1991 revenue came from systems sales. Built on a foundation of various Intel chips, the systems products include everything from board-level add-in cards to PCs for original equipment manufacturers (OEMs) to supercomputers. Tom Thornhill, a principal with Montgomery Securities Inc. of San Francisco, estimates that from 50 to 55% of the total 1991 revenue was tied to microprocessors and related products, and about 20% came from memory chips and embedded-control semiconductors.

The key to Intel's 1991 performance was the market's growing infatuation with 32-bit microprocessors, says Gordon Moore, chairman of the board. Early in the year, the company had to struggle to meet the demand for its 386DX and -SX chips. But once Intel caught up with that demand, it was able to aggressively pursue the development of its second wave, the 386SL and 486 chips, Moore says.

The year also saw Advanced Micro Devices Inc.'s hugely successful introduction of 386 clones, but Moore discounts that competition as a significant factor in Intel's push to deliver its next-generation chips. The market's insatiable demand for ever more processing cycles drives Intel's development pace more than competitive pressures, he claims.

Intel also introduced a number of new system-level products toward the end of last year. Late in 1991, Intel jumped into the local area networking business with a full suite of LAN products based on its chips. Its original equipment manufacturer (OEM) products division also scored a big win by providing the PC system components for Digital Equipment Corp.'s new Eclipse line. And the company reports strong sales of its iRMX For Windows operating system, also introduced last year. The product lets desktop PCs running the Microsoft Windows graphical user interface serve as controllers for machine tools and other factory and laboratory equipment.

Last year also saw the introduction of Intel's new generation of parallel supercomputers, dubbed the Paragon XP/S. By incorporating increasing numbers of the company's i860 XP microprocessors, Paragon XP/S machines can theoretically offer performance rates from 5 to 300 billion floating point operations per second (GFLOPS). The UNIX-based parallel processors are compatible with Intel's existing iPSC/860 supercomputers, which will still be marketed. Intel hopes its parallel machines will broach commercial as well as scientific markets, although success in the commercial realm will require the development of better software, Moore admits. "But I'm convinced there will be a large commercial market for these computers over time," he says.

By speeding ever more powerful products to market, and by offering a broad range of chip permutations, Intel hopes to stay a step ahead of 386-clone competitors like AMD and Chips And Technologies Inc. The Intel 486DX2 chip, which combines a 50-megahertz processing rate with a 25MHz interface to other system components, should be among the more popular products Intel offers this year, Moore predicts.

All told, Intel expects sell 4 to 5 million second-wave microprocessors during the fourth quarter of this year. That projection represents more than half of the available market, Moore says. Late in the year, Intel plans to introduce its next-generation P5 microprocessors, which will each contain more that 3 million transistors and will approach performance levels of 100 million instructions per second (MIPS).

Along with other U.S. semiconductor vendors, the company hopes to sell more of its products into Japan—the world's largest market for chips. But Moore doubts that U.S. penetration will reach an agreed-upon goal of 20% by year's end. For several years, Intel's Japanese sales have held at the 10% level, and Moore agrees with others who say the U.S. government may have to bring more pressure on Japan to purchase U.S. semiconductors.

Meanwhile, Intel will continue fighting court battles on the home front in an effort to limit the cloning of its 386 chips and other key products. Moore has no illusions that the ongoing string of lawsuits will soon be resolved. "The industry has significant [manufacturing] overcapacity right now, so everybody is looking for where money can be made," he says. "Intel's products sort of stick out like a sore thumb [in that regard]. But we're doing all we can to discourage companies from copying them."

—Dwight B. Davis

IS Revenue **$1.09 Billion**

29

NORTH AMERICA

ORACLE CORP.

500 Oracle Parkway
Redwood Shores, CA 94065
(415)-506-7000

Growth, Oracle Corp.'s rallying cry of the go-go 1980s, took a back seat last year to more 1990s-style watchwords such as financial responsibility, customer service and quality. And no wonder. Following years of record growth, Oracle stumbled badly in 1990. That's when the company confessed to overstating company sales, owned up to having shipped faulty software and suffered a bruising stock market pummeling as a result.

Today's more chastened Oracle appears to be a different company, largely the result of swift management action taken last year by Lawrence J. Ellison, Oracle's outspoken president and chief executive officer. In March, Ellison demoted chief financial officer (CFO) Jeffrey L. Walker to Oracle's applications business division; Walker resigned on May 31. The CFO position was awarded to Jeffrey O. Henley, former CFO for Pacific Holding Co.

Ellison then made important changes to Oracle's board of directors. In May of last year, the company announced the addition of board member Regis McKenna, the well-known international marketing consultant. Then, in March of 1992, Ellison convinced Delbert W. Yocam, Apple Computer Inc.'s former chief operating officer, to join the board.

The management and philosophy changes appear to be working. Although 1991 revenues grew just 8.3% to $1.09 billion, net earnings for the calendar year weighed in at $76 million (at least officially), a threefold increase from 1990's restated figure of $20 million. A healthy financial report at the end of the year convinced some analysts to put Oracle back on their buy lists. "We've absolutely changed our culture from growth to quality, and it's largely taken hold," says Ellison.

In trying to heal its financial wounds, Oracle is looking at new markets for its flagship database. The company must deal with the industry shift from proprietary mainframes and minicomputers—the company's traditional stronghold—to UNIX, PCs and client/server technology. "[Digital's] VMS is a declining market for us," admits Ellison, who says Digital sales have been flat for two years. "And in our vision, the IBM mainframe will not be the database server of the future. It's too expensive and slow to do that."

Oracle is making progress in UNIX. It now accounts for at least $60 million of Oracle's revenues; 70% of the company's new business comes from UNIX and desktop systems. To help boost UNIX sales even more, Oracle last year split its UNIX business into three stand-alone units: generic UNIX, Hewlett-Packard and Sun. And for the nascent client/server PC market, Oracle's Server For NetWare emerged last year well ahead of products from chief competitors Microsoft Corp. and Gupta Technologies Inc.

None of this will matter much unless Oracle succeeds soon in shipping the long-awaited Oracle version 7.0. Many of the advanced features expected in it—referential integrity, stored procedures and two-phase commit—have already been implemented by competitors. Most analysts say that version 7.0, now in beta, isn't likely to ship until late this year or early next. Considering Ellison's new-found obsession with quality, it's not likely that Oracle will ship 7.0 prematurely.

Maybe that's not so bad, though. It was substandard quality that Ellison blames for Oracle's failure to jumpstart its financial and manufacturing software applications business in prior years. But that's now been fixed, he insists, and a new company culture is dedicated to getting the bugs out and features in. "It is no surprise that our applications business is where we experienced the quality problems," says Ellison. "But we believe that we have fixed them 10 times over."—*Paul Pinella*

IS Revenue **$1.07 Billion**

30

NORTH AMERICA

QUANTUM CORP.

500 McCarthy Boulevard
Milpitas, CA 95035
(408)-894-4000

It was a tough year overall for storage manufacturers, but 12-year-old Quantum Corp. more than held its own, and it passed a major milestone—a billion dollars of revenue in 1991. Quantum's revenues vaulted up almost 50% to $1.07 billion, leapfrogging over competitor Maxtor Corp., which had revenues of $961 million in 1991, and jumped from number 39 to 30 on the North American DATAMATION 100.

The first quarter of calendar 1991 was a record for Quantum, one in which it made a $20 million profit on an unprecedented $291.3 million in revenue. Analysts attribute the 49.9% revenue gain primarily to demand from Apple Computer Inc., whose Macintosh Classic and LC desktop machines were introduced in the fall. Quantum is Apple's leading supplier of fixed disk drives.

Even so, Quantum concentrated on acquiring new customers in 1991 and, although it continued to ship drives to Apple at the same level throughout the year, Apple plunged from 40% of Quantum's business down to 15%, according to Michael Brown, executive vice president.

Revenue remained steady over the remainder of the year, but profits declined continuously, quarter by quarter. And, in the end, Quantum's 1991 profits were 25.6% lower than they had been in 1990, sliding to $49.6 million. "The whole industry was caught with way too much inventory," explains Brown. That, in turn, caused a great deal of price competition. "Prices came down about 40%," says Brown. "The average [price reduction] in our industry is about 20% per year." That meant slimmer profit margins—about 13% for the industry as a whole and 18% for Quantum, Brown estimates.

In the spring, Quantum turned its attention toward its distribution channels, signing agreements with Rein Elektronik and Inelco Peripheriques, among the leading distributors in Germany and France, respectively. In August, Quantum consolidated other distribution channels. It merged its Plus Development Corp. subsidiary, which manufacturers a line of "hard cards," hard disks on adapter cards, into its Commercial Products Division. The $300-million business unit is designed to serve the unique needs of the mass-market distribution channel. Quantum says it allows the company to take better advantage of superstore and other retail channels.

Brown attributes the strong revenue growth to Quantum's time-to-market initiative, which has cut development time from 24 to 15 months, as well as to strong sales of new products. In October, Quantum announced 11 new models of its 2.5- and 3.5-inch drives, and in November it upgraded its line of Passport removable disk drives. The Passport, which is based on Quantum's 3.5-inch ProDrives, have a new design that makes not only the media but the entire head-disk assembly ejectable. This reduces the chance that dust and debris can make their way into the fragile drive machinery when disks are switched.

—*Elizabeth Lindholm*

IS Revenue **$1.07 Billion**

31

NORTH AMERICA

TANDY CORP.

1800 One Tandy Center
Fort Worth, TX 76102
(817)-390-3700

The bad news for Tandy Corp. was that, coming into 1991, it was already battling the recession in its retail operations, and further price erosion in its PC businesses only added to an already difficult year.

IS revenues dropped 11% from $1.2 billion in 1990 to $1.07 billion in 1991, while profits plummeted 32% to $176.5 million.

But the good news was that, seizing an opportunity, Tandy quickly established a beachhead in the growing PC superstore market. By year's end, Tandy had eight new outlets sporting the Computer City SuperCenters moniker. And, in a major shift of strategy, these new superstores sell not just Tandy products but PCs and peripherals from Apple Computer Inc., AST Research Inc., Compaq Computer Corp. and IBM.

Tandy's goal for this division is simple: to be the No. 1 distributor of PCs in the United States, says Alan C. Bush, president of Computer SuperCenters International Inc., the Tandy subsidiary that operates Computer City. Analysts say the stores have done well in their first few months. And early this year the Computer SuperCenters announced the creation of a business sales group to service commercial accounts.

But other portions of Tandy's retail operations found less to cheer about last year. The continuing recession made Christmas a little less merry around Tandy's Radio Shack division. There were few celebrations, and more price cutting, as consumer spending went south. Computer sales at Radio Shack stores were further hurt by inroads made into Tandy's traditional consumer bailiwick by low-priced PCs from other manufacturers like CompuAdd Corp., Dell Computer Corp. and Gateway 2000 Inc. Tandy cut prices, along with others in the industry, but the company's margins took a beating as well.

All that didn't stop Tandy from offering new products into the channel, including a multimedia PC with a built-in compact disc, read-only memory (CD-ROM) drive, advanced sound capabilities and multimedia software.

Despite the PC bloodbath, Tandy's Grid Systems Corp., which carries the ball for the company in the *Fortune* 500 market, showed increases in its PC sales. Particularly strong were sales of the company's portable-computing devices—including PCs, handheld devices and pen-based systems.

Grid owned the pen-based market in 1991 but may not be so lucky in 1992. IBM, Momenta Corp. and NCR Corp. have started to ship products this year. Go Corp. and Microsoft Corp. should have their pen operating systems out the door by early summer. But Grid officials are confident they have a good grip on much of the market. Analysts say the company shipped 15,000 of the machines last year and may sell 40,000 in 1992.

Grid has licensed its own DOS interface, PenRight!, to several other companies, including Poqet Computer Corp. Grid will support the operating systems from Go and Microsoft, as well as its own, in future pen-based products.

Tandy also has another arm in the corporate PC market. It manufactures PCs for Digital Equipment Corp. Since Digital has recently gone on the offensive with its PC line, setting up an 800-number mail order operation, Tandy could see some residual dividends this year from that relationship.

Still, what Tandy needs is not residual dividends but consumers willing and eager to open their wallets.—*Bob Francis*

IS Revenue **$1.04 Billion**

32

NORTH AMERICA

COMMODORE INTERNATIONAL LTD.
1200 Wilson Drive
West Chester, PA 19380
(215)-431-9100

Pioneer PC supplier Commodore International Ltd. reported its best year ever since the halcyon days of 1984 when the hot-selling Commodore 64 home computer pushed it over $1 billion in sales. In 1991, Commodore reported revenues just a shade past the $1 billion mark once again. That 4.3% revenue gain was largely thanks to the continuing success of its Amiga family in Europe, traditionally Commodore's strongest market, and strict cost controls that have kept operating expenses lower and margins higher than most competitors, (competitors'.) Net earnings rose a healthy 24.6% to $50.1 million.

Europe is where Commodore continues to show its greatest strength, accounting for fully 87% of its business. Last year, the company increased Amiga unit sales nearly 25% worldwide and 30% in Europe. This, the company says, secures its status as the second-largest PC supplier to Europe behind IBM, and positions Commodore well for future business in Eastern Europe and the former Soviet Union. With both a strong market share and the Amiga operating system as assets, Commodore feels it is well placed for future growth on the Continent.

But Commodore has been hard-pressed to equal this success in the rest of the world, particularly in Asia and North America. Against a backdrop of recession and intense price wars waged by the PC-compatible makers, Commodore watched its U.S. sales slide from 18 to 9% of its sales overall for the fiscal year. Sales in Asia and Australia also decreased from the year before.

"We still have a long way to go in the U.S., but we have marketing plans in place to help make that happen," says Ron Alexander, Commodore's chief financial officer.

A number of new products introduced in 1991 could help turn the tide in the States and elsewhere, particularly as multimedia—always an Amiga speciality—begins to take off. During the year, Commodore introduced the Amiga 500+, an upgrade of its best-selling home computer, and brought out new commercial systems as well, including UNIX and tower versions of the Amiga. Designed especially for professional video production use, these larger, more expensive Amigas were well represented as the company shipped its 3-millionth Amiga in November, only a year after reaching the 2 million mark. Commodore believes the key to increasing U.S. sales lies in these higher-end Amigas used in vertical applications.

The company also moved upscale in its MS-DOS PC family. After discontinuing its line of XTs and AT clones, Commodore introduced a new line of reengineered modular systems, including 486-based PCs.

In addition, Commodore began what it calls a "phased launch" of its compact disc television, or CDTV, player last summer. One of the first CD-based interactive multimedia products for consumers, the CDTV is a low-cost, modified Amiga that attaches to a television set and plays interactive discs coming from third-party suppliers. Commodore believes that the CDTV, like the higher-end Amigas, will also drive U.S. sales higher, not only in the consumer market but in the commercial one as well.

The CDTV began shipping too late in the calendar year to contribute much to Commodore's bottom line in 1991. And because it must compete directly against a similar system from heavyweight NV Philips' GL, it may be a while before the CDTV emerges as a money machine for the company. "We never expected it to be an instant success," says Alexander. "But with both consumer and vertical applications, the future of CDTV should be quite promising." As examples of potential vertical applications, Alexander suggests retail store kiosks, corporate-training delivery tools, multimedia catalogs and the like.

—*Paul Pinella*

IS Revenue 33 **$995.0 Million**
NORTH AMERICA

AMERICAN EXPRESS CO.

American Express Tower
World Financial Center
New York, NY 10285
(212)-640-2000

American Express Co. in 1991 continued its struggle to overcome the damage done in 1990, when earnings plunged nearly $1 billion, primarily on losses from its Shearson Lehman Brothers Inc. brokerage and investment-banking operations. The company overall posted improved revenues and earnings last year, aided by the strong performance of its renamed IS division, First Data Corp. (FDC), the former American Express Information Services Co.

Total American Express revenue for 1991 rose 5.9% to $25.8 billion, and net earnings rebounded from an abysmal $181 million in 1990 to a relatively healthier $789 million in 1991, generated from segments including Travel Services, IDS Financial Services, American Express Bank, Shearson Lehman Brothers and FDC.

FDC supplies a major share of third-party MasterCard and Visa bankcard transaction processing in Britain and the United States. Ironically, FDC does not process transactions for the American Express card. Nevertheless, FDC processes more than 2 billion transactions annually, and, in addition to bank cards, these include cable television billings, payment products, telemarketing, and health care and mutual funds processing. The company is also a significant supplier of outsourced transaction-processing services.

FDC revenues climbed 20% to $995 million in 1991. Earnings rose 14.6% to $118 million for 1991. FDC attributes about half of its growth to its own business expansion and cost controls during the year, as well as to strong demand for outsourcing services. The remaining growth in revenue is the result of the midyear acquisition of Signet Ltd., which FDC calls the largest third-party bankcard processor in the United Kingdom. Signet is the first FDC operation outside the States, accounting for almost 10% of 1991 revenue. On the downside, credit card processing and telemarketing services were sluggish in the wake of the consumer spending slowdown.

Early this year, American Express announced a public offering of 44 million shares of FDC common stock. This will transform FDC into a separate corporation rather than an American Express subsidiary, although American Express will retain about 60% of FDC's stock. FDC did some creating of its own, forming Integrated Systems Technologies (IST) during 1991. IST manages data center operations for FDC and will sell systems operations services externally as well. The Shareholder Services Group, an FDC segment that provides mutual funds transfers, expanded its services during 1991 and now offers IS services for banks that manage mutual funds.—*Bill Sharp*

IS Revenue 34 **$987.0 Million**
NORTH AMERICA

MOTOROLA INC.

Motorola Center
1303 East Algonquin Road
Schaumburg, IL 60196
(708)-576-5000

In the five years since the semiconductor manufacturer decided to build microcomputers as well, Motorola Inc.'s Computer Group has grown by leaps and bounds.

While the recession pummeled many computer firms, Motorola's computers have sailed ahead. Without the baggage of proprietary systems, and with equipment designed from the beginning to run on open systems, its sales have held up well.

Demand was strong for all of Motorola's computer lines: the MultiPersonal series 8000 and Delta series 8000 network server systems, based on Motorola's 88000 UNIX/reduced instruction set computing microprocessor; and the more junior Delta Series 4000 systems, based on the M68040 microprocessor. Major contracts for the series 8000 included Automated Data Processing Inc., Chrysler Corp., Honeywell Inc. and the State of Ohio.

Motorola won't release figures, but DATAMATION estimates the Computer Group's revenues neared $400 million in 1991, up a healthy 12% from the previous year.

These figures mask some dynamic shifts, however. Tom Beaver, corporate vice president and general manager of the group, says revenues in the Computer Group's North American division soared 58%. But the averages were cut down by a disruption in shipments of microcomputers to the European market after Digital Equipment Corp. bought those operations from NV Philips' GL, a major Motorola customer. Thus, overseas revenues increased only 2%.

A further drag was flat revenues in field service, as the declining cash stream from minicomputers was offset by new revenues from servicing micro lines.

The parent company didn't fare quite so well: overall revenues rose only 4% to $11.34 billion (after rising 13% the previous year), and net earnings dropped 9% to $454 million.

And things were also not quite so rosy for the rest of Motorola's IS businesses. DATAMATION estimates Motorola's total information systems revenues last year rose a tepid 3.5% to $987 million, far short of the 11% growth of 1990. Apart from the Computer Group, the other contributors were the Codex Corp. and UDS/Motorola units, which produce all of the elements for distributed voice and data networks, from basic modems to network management systems.

Codex and UDS suffered a 2% dip in revenue to $587 million and reported an operating loss that widened to $13 million from $1 million the previous year. Codex continued to focus on its transition to the networking systems business, while sharply higher shipments of UDS's popular V.32 high-speed modem generated disappointing revenues due to pressure on prices.

During the year, Motorola broke new ground with two products: in Germany it launched its Altair wireless local area network, and in the United States unveiled its PCRadio computer terminal, which allows remote access to a company's database and voice mail, sends a fax and will receive electronic mail.

—John Morris

IS Revenue **$961.0 Million**

35

NORTH AMERICA

MAXTOR CORP.

211 River Oaks Parkway
San Jose, CA 95134
(408)-432-1700

Restructuring proved costly for Maxtor Corp. last year, as profits declined on increasing revenues for this manufacturer of storage devices for PCs, workstations and large systems. Revenues rose 21.7% to $961 million, and Maxtor posted a $65.7 million loss in 1991 after pulling in a $10.8 million profit the previous year.

Things looked bad right at the start of the year. In January, Maxtor president and chief executive officer George M. Scalise resigned, reportedly for personal reasons, but the company's board of directors was said to be unhappy about poor performance in the last half 1990. He was replaced in May by Lawrence R. Hootnick, the former president of Intel Corp.'s embedded controller and memory group. Maxtor also laid off 140 U.S. workers in January and eliminated 130 positions at its Singapore manufacturing plant.

Consequently, in March, Maxtor reported a $49.8 million loss on revenues of $224 million. About 60% of the loss was due to the restructuring or other one-time costs. But Maxtor posted a further loss of $10.7 million in the next quarter and the slide continued in the next quarter with a $9.3 million loss. These losses were also attributed primarily to one-time charges.

Even as the bad news rolled in, Maxtor and its subsidiaries rolled out several new products. At the end of April, Maxtor introduced its Tahiti II 1-gigabyte erasable optical drive. In September, Maxtor offered a line of Apache drives for Apple Computer Inc.'s much-touted PowerBook notebook. In November, Maxtor's Storage Dimensions Inc. subsidiary introduced a line of drives for NetWare local area networks.

But new products alone often can't reverse a company's fortune. In order to improve its position, Maxtor set out to sell off some of its assets. In September, the company started shopping around its Storage Dimensions subsidiary, and in November, Maxtor arranged to sell its headstack assembly plant in Penang, Malaysia, to Read-Rite Corp. for $17 million. Maxtor received a partial payment on the plant at the end of December, which helped to turn the numbers positive at the end of the year.

The company did finally turn a $4 million profit in the fourth quarter.

—Elizabeth Lindholm

IS Revenue **$935.0 Million**

36

NORTH AMERICA

MINNESOTA MINING AND MANUFACTURING CO.

3M Center
St. Paul, MN 55144
(612)-733-1110

Staying close to home is good counsel in tough times, and the idea has served the IS portion of Minnesota Mining and Manufacturing Co. well. In information systems, 3M's proven expertise is in backup data storage, and the company made solid moves during 1991 to expand its efforts in this area.

Total 1991 company revenue increased just 2.4% to $13.34 billion, and earnings dived nearly 12% to $1.15 billion as the economic downturn slashed demand for several product lines, but 3M's IS performance was better. Thanks to continued growth in memory products, 3M's computer tapes and cartridges, digital imaging systems, diskettes and optical recording products expanded revenues for their segment of the company by almost 7%, according to the Framingham, Massachusetts.-based market research house International Data Corp. DATAMATION estimates IS revenue at $935 million.

Capitalizing on its memory success, 3M announced plans to expand its 1.35-gigabyte 1/4-inch, 5.25-inch-format data cartridge family over the next three years with products boasting 10 and 35GB capacities en route to providing 100GB capacity by the end of the decade. This monumental memory maneuver will be accompanied by ongoing improvements in data transfer rates, increases in track densities and development of a high-accuracy servo-positioning system.

Meanwhile, 3M is boosting the capacity of its 3.5-inch mini data cartridges. Expect capacities in this format to grow to 400 megabytes by year's end, and reach 3GB by early 1994, suggests Stan Corker, director of removable storage research for International Data. These products will be directed at the rapidly growing workstation marketplace.

The data cartridge business has been so successful for 3M that the firm stopped making the drives themselves two years ago to avoid competing with its own customers, the other drive makers. 3M chose instead to concentrate on making the cartridges and license the drive technology to other producers.

"3M makes the most money of any of the 1/4-inch tape companies, so they are reinvesting the money in research for follow-on technology to increase capacity and performance," says Corker. "Once they develop the technology, they then license it to the drive manufacturers."

The company is well aware of the importance of new product technology. Despite its lackluster overall corporate performance, 3M reports increasing its research and development as a percentage of sales for the year to 6.85%. These ongoing investments in research produced a noteworthy accomplishment in 1991 that may improve data capacities of optical and compact disc technologies. Last summer, 3M announced development of a long-sought blue-green laser diode. This innovation, which uses shorter wavelengths than current red and infrared lasers, could dramatically improve data densities for optical recording, imaging, printing and communications applications.

Management motion was also strong for the year, as nearly half of the firm's top executives swapped suites around the globe. At the top, retiring Allen F. Jacobson was succeeded by Livio D. DeSimone as chairman and chief executive officer.—*Bill Sharp*

IS Revenue 37 **$889.9 Million**
NORTH AMERICA

DELL COMPUTER CORP.

9505 Arboretum Boulevard
Austin, TX 78759
(512)-338-4400

If 1991 was a recession year, someone forgot to tell Dell Computer Corp. The then six-year-old PC manufacturer left most other PC suppliers in a cloud of Texas dust, racking up a 63% increase in revenue to $889.9 million as it doubled overseas sales.

But as its astounding 87% rise in net earnings attests, the premier telemarketer in the PC industry didn't do it just by lowering prices. Dell racked up its $50.9 million profit through some important wins in terms of service and support. Dell scored No. 1 on the J.D. Power & Associates computer-customer satisfaction ranking at small and medium-sized companies. It also ranked high in service in a Dataquest Inc. survey. DATAMATION readers were right in there, giving the Austin, Texas-based company higher marks in PC service and support than industry giants IBM and Compaq Computer Corp. Those votes were cast in DATAMATION's fall 1991 survey of IS managers' intentions to purchase mini and microcomputers, conducted jointly with New York City-based Cowen & Co.

Dell has upped the ante in the service and support game, offering in several major cities on-site maintenance within two hours via BancTec Service Corp., a Dallas-based PC network service firm.

Like others in the PC business last year, Dell was forced to lower prices as PC clones continued to flood the market. But the declines barely caused a ripple in Dell's profits due to some aggressive cost controls. Besides AST Research Inc., Compaq and IBM, Dell competes with such upstarts as CompuAdd Corp., Gateway 2000 Inc., Northgate Computer Systems Inc. and Zeos International Ltd. And these agile newcomers are making their presence felt: Gateway 2000, for example, ran over Dell in the U.S. market, racking up $635 million in domestic revenues, some 30% more than Dell's $480 million U.S. take.

In response to such competition, Dell made some shifts in its distribution strategy last year. The company began selling some products through the CompUSA Inc. computer superstore chain and Staples Office Supply Store Inc. This year, Dell's products will see the light of day in The Price Co.'s Price Club warehouse chain, replacing Packard Bell as that company's PC supplier. Mail order sales, though, continue to account for three-fourths of all revenue, company officials say.

That distribution and service model is also selling well overseas. Building on a solid overseas base, Dell has set up telemarketing services in 12 European countries and has just announced that it will enter South America this year through a deal with Xerox Corp. "What we've found is that the business model we have in the U.S. is equally strong overseas," says Andrew R. Harris, senior vice president for international sales and marketing. Indeed, international revenues accounted for 36% of Dell's revenues last year, up slightly from 34% the previous year.

In 1991, Dell unveiled 22 new desktop and portable PC products. Stretching a relatively lean $33.1 million research and development budget, a mere 3.7% of revenue, Dell made many of those products from a fair number of off-the-shelf components. According to J. Michael O'Dell, vice president of systems development, using off-the-shelf components lets Dell's 125 engineers and programmers focus on innovations that will add more value to the product. In its laptop models, for instance, Dell designs its own microprocessors to manage battery use and has filed six patents related to that work.

Although Dell's top management has remained stable for the past few years, the company has added some experience in an advisory capacity. Former Electronic Data Systems Corp. chief executive officer Morton Meyerson spends about a week a month at Dell advising the company's managers, and former EDS counsel Thomas Luce has been named to the board of directors.

But perhaps the most telling sign that Dell's strategy had made an impact on the computer industry comes from its competition. Digital Equipment Corp. began its "Digital Direct" campaign last year, allowing corporations to purchase Digital's PCs over the phone, in a strategy very similar to Dell's. And IBM and Compaq may follow suit.—*Bob Francis*

IS Revenue **$862.5 Million**

38

NORTH AMERICA

CRAY RESEARCH INC.

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Many consider 1991 to have been a transition year for Cray Research Inc. Faced with increased competition and tighter budgets, Cray responded with a barrage of products and agreements designed to keep its traditional supercomputer customers satisfied while bringing in a new class of users at the low end of the market.

With 1991 revenues totaling $862.5 million and net earnings standing at $113 million, there's no doubt that the squeeze may be on at Cray. Although the company was able to produce adequate revenue growth of roughly 7%, net earnings were flat. Company officials predict that 1992 holds more of the same: revenues up approximately 8 to 10% with no increase in earnings. Analysts cite Cray's move to sell more lower-priced, lower-margin systems and more competition all around as a main reason for the lack of profits.

Cray prides itself for being a technology-driven company and seemed to realize that some marketing jobs are best left to others, particularly in the unfamiliar minisupercomputer field. In January 1992, just two months after announcing a new entry-level system, the Y-MP EL (priced from $300,000), Cray effectively handed over all marketing and sales rights for the system to Digital Equipment Corp.

The two companies then tightened their relationship further. Cray has decided to use Digital's 64-bit Alpha reduced instruction set computing microprocessor for its first-generation massively parallel processing (MPP) system, due for delivery in 1993. No chip decision has yet been made for the second- and third-generation MPP supercomputers due out in 1995 and 1997, respectively.

The issue of MPP systems have dogged Cray for the last few years. Although it remains to be seen if MPP systems will offer any tremendous price/performance breakthroughs, or if software can be refined enough to handle hundreds or even thousands of microprocessors, MPP is seen as the hot new technology not only by Cray but by a slew of competitors hot on Cray's trail.

"Our primary goal in bringing MPP technologies into the mainstream supercomputing marketplace is commercial viability—the system's ability to help a broad base of users solve real-world problems faster than ever before," states Cray chairman and chief executive officer John A. Rollwagen.

So while Cray continues to boost its Y-MP vector-processing technology, it can't ignore the host of companies building MPP systems. It received a boost when the Defense Advanced Research Projects Agency (DARPA) agreed to contribute $12.7 million toward Cray's MPP program. Yet Cray now finds itself in the position of needing to support two separate architectures and somehow to closely integrate the two.

Meanwhile, the company continues to enhance its traditional supercomputer line. In November, Cray announced the Y-MP C90, which operates at four times the speed of Cray's previous fastest computer and carries a price tag in the $30 million range. Analysts believe Cray will ship seven C90s in 1992. The C90 was important to Cray, as the company saw some sales of its previous-generation supercomputers slip away to competitors Fujitsu Ltd. and NEC Corp.

In other developments, Cray acquired most of the assets of bankrupt Floating Point Systems Inc. for $3.25 million and created a new subsidiary that will make high-end servers based on Sun Microsystems Inc.'s SPARC RISC technology. Sun and Cray say they will work together to tie Sun systems in with Cray supercomputers.

On the executive front, 15-year Cray veteran John F. Carlson was named president and chief operating officer in September, filling the spot left by Marcelo A. Gumucio, who resigned back in July 1990. The company also created and filled the new post of chief technical officer with executive vice president Lester T. Davis.—*Susan Kerr*

IS Revenue **$850.0 Million**

39

NORTH AMERICA

GENERAL ELECTRIC CO.

3135 Easton Turnpike
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General Electric Information Services (GEIS) contributed about $650 million of the revenues reported by General Electric Co., thereby providing the bulk of GE's IS revenues in

1991. DATAMATION estimates General Electric Co.'s total IS (which includes hardware maintenance revenues from other operations) to be $850 million, up 6.3% from 1991.

GEIS's $650 million is barely 1% of GE's total take of $60.24 billion and $2.6 billion in net earnings. Nevertheless, it's a key element in the company's worldwide business communications activities. For example, $16 billion of the $60 billion in payments to GE last year were sent over an electronic payments system that GEIS developed. Called Customer Originated Electronic Payments (COEP), it enables both GE and customers of the company's electronic data interchange (EDI) service to collect receivables electronically. This is expected to be one of the major byproducts of EDI for the company in 1992, says Dennis J. Crane, GEIS's vice president of marketing.

EDI, the paperless transmission between customers and suppliers of purchase orders, shipping notices, invoices and order acknowledgments, is GEIS's fastest growing business, rising 40% last year. GEIS provides the networks that transmit the data between the trading partners' computers, as well as services over those networks. Transmission, and such services as electronic mail and messaging, grew at a 25 to 30% mark, says Crane. Overall, GEIS business is growing 10%.

Last year, the company signed up its 10,000th EDI trading partner, H.J. Heinz Co. Australia. Ltd., a wholly owned subsidiary of processed food giant H.J. Heinz Co. Trading partners consist of large buyers and their multiple medium-sized and small suppliers. GEIS has been adding such customers of its value-added network at the rate of 2,000 a year for the last three years.

GEIS and other value-added network providers furnish electronic mailboxes for EDI partners to send and retrieve EDI messages. GEIS calls this service EDI*Express. It also provides software that translates differing industry codes into a common language (EDI*PC System, version 7, and EDI*Central System). More recently, GEIS and other value-added network purveyors have been providing PC-based mapping software that lets trading partners integrate EDI functions into their own in-house applications, so that data from the applications need not be rekeyed to be transmitted through EDI. They also help major customers acquaint smaller suppliers with EDI.

This year, GEIS began offering a Bank Agent Program to allow banks to provide both EDI and electronic funds transfer (EFT) services to their customers. Suppliers receive remittance notices from their customers, while payment transfers are exchanged between their banks.

Other new products included enhancements to existing offerings. In May 1991, GEIS began offering a communications software system to the sales automation market. It automates such functions as lead tracking, order entry, scheduling, tickler file notification, forecasting and call reporting in a far-flung enterprise.

GEIS also made available what it calls a streamlined version of its UPC*Express catalog service, which lets users look up the identification numbers of more than 90,000 uniform product code council (UPC) manufacturers either on line or in batch mode. One customer, Dayton Hudson Corp.'s Department Store Division, is already accessing more than 70 vendor catalogs through the service.

Early this spring, GEIS also announced an enhancement to its QuickNews Service—a personalized electronic news-clipping service that is delivered to subscribers' e-mail boxes. The enhancement allows customers greater freedom to tailor the kinds of news they order to their specific business interests.

Crane says GEIS expects international standards compliance to have a major impact on its 1992 revenues. He says GEIS had 16 interconnections to other X.400 public service networks and will add another 12 in 1992. X.400 is a messaging standard promulgated by the Consultative Committee on International Telephony and Telegraphy (CCITT). GEIS's GEMS 2000 (for GE Messaging System), driven by another CCITT standard, X.500 for electronic mail directory services, has been deployed throughout GE, linking 75 different messaging systems. But Crane says GEIS won't offer the system to the public before "well into 1993."—*Tom McCusker*

IS Revenue 40 **$828.9 Million**
NORTH AMERICA

LOTUS DEVELOPMENT CORP.

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Lotus Development Corp. should have had a lousy 1991, judging by the most important product announcement from the spreadsheet, communications and CD-ROM software giant. After long and embarrassing delays, Lotus 1-2-3 For Windows debuted only to be battered by lukewarm reviews, reports of bugs and slow sales. Not exactly the assault Lotus envisioned against Microsoft Corp.'s Excel, the one product ever to seriously threaten Lotus's long reign over the PC spreadsheet market.

Things looked shaky in the executive suite as well. Several key execs of vice presidential rank or better left for greener pastures last year. The highest ranking one was senior vice president Frank King, replaced by John Landry, formerly of Dun & Bradstreet Software Services Inc.

What's worse, Lotus suffered its biggest layoffs ever, reducing staff by 10% through a combination of attrition, restructuring and layoffs.

But, all things considered, Lotus had a pretty good 1991—a record year, in fact, in terms of revenue, which climbed 19.7% to $828.9 million, keeping it the No. 4 U.S. independent software maker on the North American DATAMATION 100. But the net earnings of $43.1 million, although 85% higher than 1990's level, were lower than analysts had predicted, thanks to a hefty $23 million restructuring charge taken in the fourth quarter.

Last year's profits would have fallen below 1990's level had Lotus not taken a one-time $53 million hit late in 1990 related to the acquisition of Samna Corp. and its Ami Professional word-processing package.

Still, Robert K. Weiler, senior vice president for Lotus's North American Business Group, says 1991 "absolutely returned us to dominance in the spreadsheet market," citing a 60% share of the overall spreadsheet market (Excel notwithstanding), and a 90%+ share of the MS-DOS spreadsheet market.

Lotus may begin to gain some of the Windows spreadsheet market following its April shipment of 1-2-3/W 1.1, an upgrade Weiler says overcomes the performance flaws of the first release. In addition to Windows and MS-DOS, Lotus spreadsheets now support NeXT, VAX/VMS, Sun SPARC, Macintosh System 7, OS/2 (release 1.1, with a release 2.0 version on the burner), IBM-compatible mainframe and Hewlett-Packard Palmtop operating systems.

And spreadsheets aren't even the big story for Lotus anymore. President and chief executive officer Jim Manzi is following the money trail blazed by the company's Notes groupware and cc:Mail electronic mail package for local area networks. Revenue from cc:Mail nearly tripled in 1991, and the package was selected by big customers like the U.S. Navy, which will hook up 80,000 cc:Mail users in the next three years, Lotus states. Says Manzi: "We believe the communications business offers one of the greatest opportunities for new growth."—*Ned Snell*

IS Revenue **$827.3 Million**

41

NORTH AMERICA

AST RESEARCH INC.

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AST Research Inc. grew almost twice as fast in 1991 as it did in 1990, as revenue swelled 41.1% to $827.3 million, far outpacing the previous year's 21.7% gain. If its 1992 revenue growth sustains last year's pace, AST will become a billion-dollar company well before December. Not bad for a PC maker that was started a dozen years ago by three immigrant entrepreneurs who put their homes in hock to get the business going.

Yet the secret of this success is no secret at all, according to president and cofounder Safi U. Qureshey: "We get paid for execution. Our strategies are obvious—everybody knows about them."

Qureshey calls AST's core strategy "value marketing—having the right product at the right time at the right price." AST rarely makes the fastest, cheapest or most avant-garde PCs; instead, it aims at superior price/performance and support in a multibrand strategy that addresses every major market—and many niches too.

Getting products to market at the right price has its price, however. Net earnings rose a merely respectable, but by no means impressive, 33.7% to $70.2 million in 1991, while its ratio of earnings to revenue slipped a bit to 8.4%. Also, a stronger dollar affected the 41% of revenues coming from overseas.

AST began 1991 with three main product lines. The Premium PCs, with upgradable processor/memory boards, and Exec notebooks (designed and built in house), both are aimed at *Fortune* 500 buyers, while the Bravo desktop PCs are intended for smaller firms with tighter budgets.

During 1991, AST further diversified its product offerings, introducing the Advantage! notebook and desktop PCs for the consumer retail market. The company also added network servers to its Premium line and announced the MicroFrame symmetrical multiprocessor superservers, due this summer.

The MicroFrames will compete with IBM AS/400s and other midrange systems. So AST is building relationships with value-added resellers of minicomputers and teaming with software houses to port over mini-based vertical applications. Similar micro-based projects are planned, such as 1991's joint venture with computer-aided design vendor CalComp to produce the micro-based Medallion CAD workstation.

Internationally, AST produced a line of bilingual PCs for the new Japanese DOS/V standard.

This spring, AST introduced the new Power Premium desktop series featuring built-in accelerated graphics for Windows and other graphical environments. And the year is far from over for this fast-moving vendor.

—*Lee Thé*

IS Revenue **$747.9 Million**

42

NORTH AMERICA

TEXAS INSTRUMENTS INC.

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Texas Instruments Inc.'s Information Technology group was a bright spot in an otherwise slow year for the chip and computer maker. IS revenues grew 6.8% to $747.9 million. While that was nowhere near the previous year's 20% climb, it was twice as strong as the parent company's 3.3% revenue gain to $6.78 billion, which itself was entirely swallowed up in a massive $409 million loss.

The IT group accelerated its shift toward software, making its Information Engineering Facility (IEF) computer-aided software-engineering (CASE) tool available on an ever-widening range of hardware platforms, and signing marketing agreements for IEF with Hewlett-Packard Co. and IBM. TI also added overseas technical support for the IEF product line and a kanji version for the Japanese market.

A new Enterprise Systems business, launched "with vigor" in 1991, according to IT head John W. White, furthered the shift toward software and services. The unit will sell software for what TI calls "critical internal functions," such as computer-aided design and manufacturing (CAD/CAM), marketing and procurement. TI also sold off all of its industrial automation and control systems business and acquired the European information-engineering business of James Martin & Co. The James Martin acquisition, says White, was needed to bolster global support for TI's software and services.

On the hardware side, TI's notebook-sized computer, unveiled in 1991, captured 7 to 9% of the worldwide notebook computer market by year's end, says White.

Other segments of TI didn't fare as well last year, however. Cuts in defense spending, lower prices for its dynamic random access memory (DRAM) chips and a slow economy contributed to its mounting losses—the 1991 $409 million loss came on the heels of $39 million in red ink in 1990. Beyond market factors, the losses involved charges taken for cost-cutting measures that included layoffs and a restructuring of business processes. Other charges represented start-up expenses associated with the construction of new semiconductor-manufacturing capacity.

The outlook by the end of this year should be better. TI's new chip-manufacturing capacity will reduce production costs, making up for some of the drop in chip prices. In defense, TI's high-speed antiradiation missile (HARM) figured prominently in the 1991 Persian Gulf war, and the company is in a good position to attract the defense dollars still out there, says White. But analysts say TI won't start making a profit from operations until at least the fourth quarter of 1992.

The IT group and its CASE tools have been a catalyst for restructuring business and manufacturing processes throughout TI. As the economy begins to recover in late 1992, says White, a newly streamlined TI will be in prime position to move with it.

—Leila Davis

IS Revenue **$733.0 Million**

43

NORTH AMERICA

PRICE WATERHOUSE

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The conservative strategies—and image—of Big Six accounting firm Price Waterhouse served it well in its information services consulting practice in 1991. Last year, PW continued to push heavily to keep its costs at 1990 levels and focused tightly on core industries and services, avoiding outsourcing and reselling. As a result, Price Waterhouse's IS business has maintained its 25% growth goals. Price Waterhouse's worldwide revenues were actually up 25.7% to $733 million from its information services consulting businesses in 1991. The company's total worldwide revenues rose 25.1% to $3.60 billion.

Price Waterhouse has focused its information services businesses on large companies in large industries, where the accounting firm's restrained approach meshes well with its customers' corporate cultures. Its targeted industries are financial, manufacturing, public utilities, petroleum, insurance, retailing and government.

In the past, as much as 30% of PW's integration work has been for the government sector, but that figure is now down to 10%, according to W. Dale Young, managing partner for PW's U.S. Open Systems Integration group in Bethesda, Md. He attributes the decline in government work as a percentage of business to the faster growth in commercial integration work rather than to any drop in business from the public sector.

PW does not resell hardware or software, but instead forms marketing agreements with the vendors to work with their clients as consultants and integrators. The few outsourcing agreements Price Waterhouse has pursued have been either to manage an experimental department for a client or to manage a facility while it was being reengineered by PW consultants. In any case, outsourcing is seen as an interim service, according to Young.

PW has set its sights on a few core services as well as industries, says Young. Those are application software package installation, industry-oriented application software developed in house, business process transformation and systems integration. In 1991, the hottest areas for PW proved to be business process transformation, reengineering and open systems.

Price Waterhouse is beginning to make some headway in reengineering with its Arrae family of reengineering tools. Even though interest in reengineering is picking up, analysts say PW has had an uphill battle to build a market for itself over the past three years. Still, PW is an early player in this new market and is expected to be in a good position for future growth.

The biggest competitor PW has had to face over the past year is the economy, according to Young. Many of its targeted industries felt the recessional pinch, so PW clients are doing more in house these days instead of hiring consulting services, Young believes.

There has also been a change in the typical contract when the firm does win a bid. "The very large contracts for $20 million or so are just disappearing. The ones already under bid have just dwindled away, and no new ones of that size are coming up," he says. "Instead, we are doing pretty well with a number of $5 million contracts. Clients are finding those more manageable right now."

"It is a good thing we've kept our costs in check," Young concludes. "Now, we are at 85% utilization and have a six-month backlog—we may have to start doing some hiring."

—Leila Davis

IS Revenue $710.4 Million

44

NORTH AMERICA

NOVELL INC.
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Provo, UT 84606
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Novell Inc. last year firmly established itself as a one-stop source for network-operating systems. It did this through a flurry of acquisitions and alliances, including a distribution and support pact with IBM that has started to account for 5 to 10% of its NetWare network-operating system sales.

The strategy paid off handsomely, leading to a formidable 68% increase in net earnings to $184 million and to 1991 revenues of $710 million, a 35% increase over the previous year that was more than double 1990's revenue gain.

And the key to it all was the agreement with IBM, says James R. Tolonen, Novell's chief financial officer. That changed Novell from being a player in the smaller, departmental markets and gave the company credibility in larger corporatewide markets.

In addition to the pact with IBM, Novell in 1991 sought to strengthen its connections to other major computer vendors. The company reached an agreement with Hewlett-Packard Co., similar to the IBM agreement, under which both companies will develop products that operate in each other's environments. HP also receives the right to market, service and support Novell's NetWare worldwide.

Novell also captured a DOS operating system capability with the acquisition of Digital Research Inc. in late October, which it will operate as a wholly owned subsidiary, renamed the Digital Research Systems Group. DR is the originator of CP/M, the first PC operating system, and its present products include DR DOS 6.0, Multiuser DOS and the FlexOS operating system for point-of-sale and process control systems.

Novell in December acquired a 55% interest in a joint venture with AT&T's UNIX System Laboratories Inc. The company, called Univel, was set up to develop general purpose applications to run under AT&T's UNIX operating system. Initial products will be offered under release 4.1 of UNIX System V. Novell acquired a 5% interest in USL in April for $15 million, and its chairman, Ray Noorda, is a member of USL's board.

Sales of NetWare accounted for 80% of Novell's 1991 revenues. Other software revenues, accounting for 9%, came from communications and database products that support NetWare, as well as from network analysis, monitoring and Tran-smission Control Protocol/-Internet Protocol (TCP/IP) communications protocol products. Hardware revenues contributed the other 11%.

Novell took some of the healthy profit it had made in 1990 and thrust it into product development, which rose 31% in 1991 to $77.9 million. The result was new versions of NetWare (versions 2.2 and 3.11, with a built-in TCP/IP protocol). The company also announced links to IBM's NetView network manager. Along with version 3.11 of NetWare, Novell offered applications in the form of modules that can be loaded onto the network as needed. Called Network Loadable Modules (NLMs), they include NetWare for UNIX; for Sun Microsystems Inc.'s Network File System (NFS); for the Macintosh; and for IBM's File Transfer, Access and Management/Manipulation (FTAM) and Systems Application Architecture (SAA).

Novell also brought out a poor man's network-operating system called NetWare Lite, priced at $99 per node, in contrast to NetWare 3.11, which for small groups of users (say, 10) can cost as much as $249 per node. It is Novell's response to the growing acceptance among smaller users of Artisoft Inc.'s LANtastic.

Novell reports overseas sales continuing to grow, rising to $280.3 million in fiscal 1991, which ended in October. That was 42% more than in 1990. Early this year, newly formed Novell Japan Ltd. began shipping a Japanese translation of NetWare For Apple Mac network software. NetWare For Macintosh J will run as an NLM on the Japanese version of the NetWare operating system.

Looking forward, Tolonen says that Novell and IBM together have defined 32 specific development projects to be built using IBM's Systems Application Architecture (SAA) or to work under NetView. "That is where the long-term commitment by both companies to interoperability is being developed," says Tolonen.*—Tom McCusker*

IS Revenue $675.9 Million

45

NORTH AMERICA

PACKARD BELL ELECTRONICS INC.
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If the Packard Bell name just resonates with quality for you, that could be because it was once the name of a highly popular brand of console radio—back when that medium was a chief source of home entertainment. But the Packard Bell whose computers you see in every Sears and Wal-Mart is an enterprising young company—founded in 1986—which purchased the name, logo and even the slogan ("America grew up listening to us. It still does") of the older, now-defunct consumer electronics firm.

Privately held until early 1992, the new Packard Bell has been tight-lipped about its exploits in the home-office and small-business markets. But with its public stock offering in March of this year, results of the company's carefully plotted, craftily executed assault on consumer retail channels were made known. To say the least, the spoils are impressive: $676 million in net sales for calendar 1991. That's up 30.5% from $518 million in net sales for 1990 and an increase of almost 100% over $338 million in 1989. The company also reported net earnings of $4.6 million.

According to Bruce Stephen, PC industry analyst with International Data Corp. in Framingham, Mass., Packard Bell shipped 250,000 units in the U.S. market alone last year for a 4.3% share of market—placing it second only to IBM and Compaq. "Packard Bell has a simple strategy: market penetration," Stephen observes, noting that in 1991 the company garnered 28.2% of all PC sales in the rapidly expanding mass-merchant distribution channel. With shelf space at more than 4,000 U.S. retail outlets, Packard Bell far outstrips its closest competitors, AST Research Inc., Dell Computer Corp. and Everex Systems Inc.—all of which have attempted late entry into the mass merchandise market.

Packard Bell's tight grip on retail channels does have its drawbacks, however. Unlike low-overhead competitors, such as Gateway 2000 Inc. and Zeos International Ltd., which operate almost strictly through direct-mail channels, Packard Bell must contend with retail headaches that can hammer away at its profit margins. High product return rates—resulting from retailers' liberal exchange policies—consistently trim the company's gross sales by 15% or more. In fact, Packard Bell's 1991 gross revenue reached $819 million, but that figure included $143 million worth of products that were eventually returned.

And because many merchandisers prefer not to compete head-to-head on price, the company must maintain several "exclusive" product line names for its basic PC configurations. Axcel, Executive, Force, Legend, Packmate and, of course, Packard Bell, are all brand names used by Packard Bell resellers in the United States.

While the company's success with U.S. consumers is indisputable, industry analysts have begun to question where Packard Bell can grow from here. One logical strategy would be to transplant its retail channel approach to other consumer markets, particularly in Europe. But IDC's Stephen thinks replicating a U.S.-style distribution network in Europe's complex international market might prove difficult. Although Packard Bell saw its European sales leap by 136% to $58 million in calendar 1991, European business still accounts for only 8.6% of the company's overall annual revenue, and at present Packard Bell Europe has few established retail relationships outside the United Kingdom.

George Thompson, senior analyst at Datapro Information Services Group of Delran, N.J., thinks Packard Bell's primary objective should be to penetrate the U.S. corporate market. But this, too, could prove daunting. Competitors like AST and Dell have established footholds in corporate accounts by pumping money into research and development and delivering state-of-the-art products at affordable prices. Packard Bell, however, is a guerrilla marketer, not a technology innovator, and doesn't have the resources to pursue a technology-driven strategy. "Even price-conscious corporate customers expect more in the way of advanced functionality than home users do," says Thompson, "and as of today, Packard Bell can't provide it."—*Don Marks*

IS Revenue **$653.0 Million**

46

N O R T H · A M E R I C A

SCIENCE APPLICATIONS INTERNATIONAL CORP.

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Like most companies with strong links to the defense industry, Science Applications International Corp. has been under the gun in the past couple of years to find new outlets for its mainly military or defense-related product sets and services.

Last year, the company did a bang-up job of doing just that. Overall revenue increased by 10% to $1.28 billion, and IS-based revenue grew even faster, up by 14.8% to $653 million. To keep up with its increase in sales, the company also boosted hiring by 11% in 1991.

Where's all this growth coming from in a demilitarizing economy? Here are some examples of where SAIC is finding its new customers:

Florida's Orlando-Orange County Expressway Authority gave the company a $15.4 million multiyear contract to develop and install an electronic toll collection system last year. SAIC will be using technologies it developed for the Department of Defense to track nuclear weapons; the civilian version of the technology, known as automatic vehicle identification (AVI), identifies each participating auto as it passes through toll booths, then debits each auto owner's account at the end of the month.

The federal Environmental Protection Agency awarded the company a multiyear, $100-million-plus contract to create a systems development center for the agency in Washington, D.C., and to develop a standardized data-gathering and -processing system for EPA offices nationwide. The project is similar to one SAIC has managed for the Department of Defense in the past.

Of course, these aren't the only ways

in which SAIC is beginning to shift away from its dependence on defense spending. The company is also moving to shore up its system integration activities and outsourcing services. Last year, systems integration and consulting represented about 25% of revenue; facilities management accounted for another 4%. All told, SAIC has about a $2 billion backlog of systems integration services orders in the bank, along with another $1 billion in software development contracts.

"SAIC expects the integration services business to grow at an annual compound rate of 15 to 20% in the 1990s," says James E. Russell, senior vice president at SAIC's McLean, Va., offices. "In the next five years, SAIC expects to double in staff and revenue, and we forecast that one-half of this growth will come from the integration services business."

SAIC, with 200 offices worldwide, is wholly owned by its 13,510 employees and has been since it began in 1969.

—J. William Semich

IS Revenue **$638.0 Million**

47

NORTH AMERICA

SILICON GRAPHICS INC.

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(415)-960-1980

For Silicon Graphics Inc., a company used to keeping a low profile, last year proved to be a bit of a coming out party. Focusing on high-end graphics technology for the technical-computing market was still its prime directive. But new lower-priced systems, the Indigo and the Crimson lines, have moved the company toward the limelight of the middle range workstation market—and into the public eye.

And as if that weren't enough, Silicon Graphics stepped squarely into the klieg lights in the company of the summer blockbuster film *Terminator 2*, when its workstations were identified as the engines behind many of the special effects. In particular, the workstations conjured up the "morphing" sequences, in which bodies mutated, on camera, into other bodies, various weapons and, in one case, even a linoleum floor.

But morphing muscle men wasn't necessarily the high point of the year for Silicon Graphics. The company's revenues grew an impressive 32.3% to $638 million. Still, that was short of the 41% rise of the previous year, and 1991 net earnings were down 8% to $36.6 million. The company says it remains committed to the technical side of the visual-processing market, but both the revenue growth and the earnings dip came from the shift to the lower-end workstations, which at prices starting in the $10,000 range brought in many revenue dollars, but at low margins.

Although Silicon Graphics is no Dell Computer Corp., it has been using an 800 number to sell the lower-priced machines. The idea is to direct potential customers to dealers. Those products have gone down well with customers, analysts say.

Silicon Graphics's workstations and servers are built around reduced instruction set computing microprocessors from Mips Computer Systems Inc. Soon, however, it may be building them itself, as it announced in March of this year that it was merging with Mips. Assuming the merger goes through, Silicon Graphics will likely take control of most, if not all, of Mips's systems business, which will add even more lower-priced offerings to the company's mix. The marketing and licensing divisions of Mips will become a subsidiary of Silicon Graphics called Mips Technologies Inc.

The downside to the merger is the risk that the Mips architecture will now be perceived as a captive, vendor-specific platform. Analysts see that as unlikely—but it is likely to be brought up by Silicon Graphics's competitors (like Hewlett-Packard Co., IBM or Sun Microsystems Inc.).

Besides supplying Silicon Graphics with its chips, Mips was also a partner in the Advanced Computing Environment (ACE) consortium. Silicon Graphics has gradually become a more important player in that group, a position the merger with Mips will only increase. According to Richard Chu, analyst at Cowen & Co. in Boston, the merger with Mips should give the combined companies a significant technology advantage in the competitive workstation market.

Compaq Computer Corp. has also been a partner in the ACE group and had an equity interest in Silicon Graphics as well. But as Compaq began to focus on its core PC business, it decided to end its investment, which it did when Silicon Graphics bought back its stock in February 1992.

—Bob Francis

IS Revenue **$635.0 Million**

48

NORTH AMERICA

GATEWAY 2000 INC.

610 Gateway Drive
North Sioux City, SD 57049
(605)-232-2000

If you're looking for reasons why Compaq Computer Corp. chief executive Rod Canion lost his job last year, an aggressive little company called Gateway 2000 Inc. might come to your attention. For the last five years, this lean, mean mail-order machine has been selling IBM PC-compatibles at wholesale prices and making life progressively more difficult for PC industry big shots.

Just look at that number—annual revenue of $635 million for 1991. That's more than twice the prior year's take. And every byte of that business was transacted through direct mail. No costly distribution channels, no tricky retail relations, no niche positioning, no shelf space woes. Just clear, 1-800-number, you-ask-for-it, we'll-ship-it-to-you, direct sales.

According to Bruce Stephen, director of PC hardware research at International Data Corp. in Framingham, Mass., all that revenue amounted to about 235,000 units shipped—enough to make privately held Gateway the No. 6 vendor of personal computers in the United States in 1991, in IDC's estimation. "One year ago," says Stephen, "Gateway was 19th in terms of market share with about 1%. This year, they've got 2.4% of the market. According to our estimates, that makes them the fastest growing PC vendor in the U.S."

There are, of course, downsides to phenomenal growth. Gateway nearly tripled its work force in calendar 1991, adding almost 1,000 employees to its existing 400. That may seem like rapid deployment in a recession-racked economy, and it is. But when you look at Gateway's ratio of workers to revenue dollars, you realize that this company is still in the enviable position of generating approximately $450,000 per employee. That should give John Akers at $188,000-per-employee IBM something to think about as Big Blue embarks on its own low-cost PC clone venture this summer.

So far, Gateway has maintained its entrepreneurial edge by concentrating exclusively on price and service. "We're constantly struggling to keep prices down," says marketing manager Mike Schmith, "but without stinting on quality components or extras like free on-site service." According to IDC's Stephen, this tight-squeeze strategy has enabled Gateway to steal market share from direct-mail competitors such as Swan Technologies and Zeos International Ltd. in the cost-conscious home office market while making inroads against larger vendors like Epson America Inc. and Tandy Corp. with service- and support-minded small-business customers.

Continuing to expand at breakneck speed, however, could prove increasingly difficult for Gateway. One potential source of future growth is the European market. But direct mail overseas involves a complicated and costly web of marketing and shipping arrangements. Another avenue would be to fill the holes in Gateway's current product line. The company is slated to offer several portable computers this spring.

Gateway also could do more to position its 486 systems as network servers for corporate customers. In fact, the company still has a relatively low profile in the corporate sector. But with business buyers becoming more market savvy, Schmith thinks satisfied Gateway customers could start to order the same budget-priced gear for the office that they've bought for their homes.—*Don Marks*

IS Revenue **49** **$622.8 Million**

NORTH AMERICA

PRC INC.

1500 PRC Drive
McLean, VA 22102
(703)-556-1000

For The Black & Decker Corp.'s information systems business, 1991 was a watershed year. The company merged its Planning Research Corp. on the first of the year with another large government systems integrator, Advanced Technology Inc., to become one Black & Decker company—PRC Inc. The parent then installed a new and very aggressive management team made up primarily of former Oracle Corp. executives, headed by PRC president Gary D. Kennedy. At press time, PRC was preparing a public stock offering.

PRC now encompasses all of Black & Decker's information systems business, and analysts say B&D is happy with PRC's performance. Non-IS portions of B&D's business have suffered in the present economy, however, and well-placed analysts say PRC has been restrained from spending enough to support the aggressive growth Kennedy has planned for it. The public offering is expected to ease those restraints somewhat.

The new PRC's revenues for 1991 totaled $685.2 million. Of that total, PRC designates $622.8 million as IS revenue. Since at press time PRC was not a publicly held company, no other figures were made available. Analysts say that Kennedy and Bob Laurence, president of PRC Commercial Systems Group, are known for setting high revenue goals but are less aggressive about profitability. The party line both inside and outside the company is that they have achieved revenue goals and are growing as fast or faster than projected. Kennedy declined to comment on profitability because of the pending public offering.

The firm's government-contracting business remains strong despite federal cutbacks in its primary market, defense. PRC has made a strategic shift toward civilian agencies and toward those defense functions spared from the cuts, such as logistics support. At the end of 1991, PRC had a $1.6 billion contract backlog, a healthy jump from the approximately $500 million contract backlog at the end of 1990.

PRC also began a strategic push into commercial and international markets in 1991. While observers say the move is both smart and necessary for PRC's future, no immediate results are visible. "It may be too early to tell, or they may be making the mistake of trying to sell commercial accounts with a federal marketing force," says one analyst. "I haven't noticed them adding a lot of new marketing personnel to PRC Commercial Systems."

Overseas, PRC established an Australian subsidiary, PRC International PLC in Sydney, and signed a cooperative-marketing agreement with Digital Equipment Corp. Australia to comarket PRC application solutions with DEC computers. In addition, PRC signed an agreement with British computer company ICL PLC to develop and market image-management systems to businesses in Britain, Europe and the United States.

Imaging and optical storage is one of five "core competencies" that PRC has identified as key to expanded growth in both federal and commercial work. To that end, in 1991 the firm acquired FSA Inc. (now PRC Document Conversion Services). In addition, PRC has initiated pilot projects to develop engineering document management systems for major companies in manufacturing and petroleum.

The other core competencies are open systems integration, telecommunications, technology transfer and software engineering. To support its commitment to open systems, PRC launched a new subsidiary called PRC Openware Inc. Its first products are an object database management system offered through a partnership with its developer, Object Design Inc., and a software conversion product developed by PRC.

The chief challenge facing PRC is to follow through on the aggressive growth paths charted by Kennedy in commercial and international markets. The strategy is healthy, say analysts who contend that PRC previously suffered from too cautious a management approach. A lot will depend, however, on how successful the public offering is and what resources PRC will be able to apply toward Kennedy's goals. *—Leila Davis*

IS Revenue **$601.2 Million**

50

NORTH AMERICA

SHL SYSTEMHOUSE INC.
Suite 501
50 O'Connor Street
Ottawa, Ontario, Canada K1P 6L2
(613)-236-1428

Long heralded by analysts as the integrator most likely to succeed at client/server systems development, SHL Systemhouse Inc. has finally begun to fulfill its promise. After a rocky 1990, which saw the breakup of parent company Kinburn Technology Corp., the transfer of Systemhouse ownership to a coterie of Canadian banks (Kinburn's creditors) and the departure of chief executive officer Roderick Bryden, the firm's pleasantly eventful 1991 must have seemed like a cakewalk.

Systemhouse's past financial woes, it appears, were mostly of Kinburn's making, although recessionary economies in Britain, Canada and the United States didn't help matters. The firm's revenues for fiscal 1991 held steady at a healthy C$689 million ($601.2 million), but restructuring charges and reduced profit margins on microcomputer-based systems integration projects soaked the company with a C$20 million ($17.5 million) loss. As in 1990, approx-imately half of Systemhouse's revenue came

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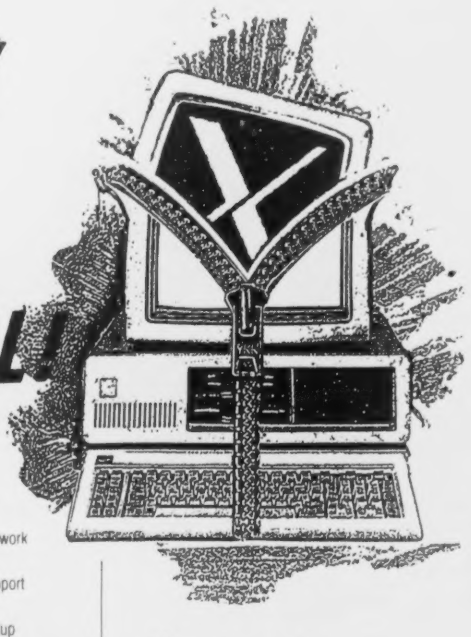

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Circle 1 on Reader Card

from systems providers, including ComputerLand Canada and newly acquired Computer-Group PLC U.K., both wholly owned subsidiaries.

Still, last year's losses were far lower than 1990's C$40 million ($35 million) deficit. And the company's finances improved steadily throughout 1991, as a new leadership team and revamped marketing strategy began to jell. Much of calendar 1991, in fact, was devoted to implementing a new management structure, refining business goals and refocusing systems integration efforts on workstation- and network-based client/server technology. The last quarter was spent reaping the benefits of the restructuring in the form of two huge outsourcing agreements, together worth over C$100 million ($86 million), one with the provincial government of Nova Scotia, the other with Maritime Telegraph And Telephone Co. Ltd.—one of Canada's largest telecommunications firms.

Systemhouse's new chairman and chief executive, John Oltman, who joined the company in June, hails from systems integrator extraordinaire Andersen Consulting, as do several other top-tier executives at Systemhouse. Industry observer Pete Rosati with International Data Corp. in Framingham, Mass., says Oltman and his colleagues bring "a commitment to total quality management" and "a lot of entrepreneurial energy" to the company.

To maximize its resources, Systemhouse has reorganized its business around four target markets: telecommunications, postal agencies, human services and energy companies. According to Oltman, these sophisticated vertical markets require industry-specific knowledge and technical expertise well suited to Systemhouse's long experience in strategic client/server systems. This affords Systemhouse the opportunity to pitch its services as more than a way to cut costs by off-loading back-office functions, and to distinguish itself from its larger competitors whose strengths are more in host-based systems. Contracts with Bell Canada, the U.S. Postal Service, the state of California and Petro-Canada—all signed in the second half of 1991—demonstrate the company's strengths in these chosen markets.

Bonnie Digrius, who monitors systems integrators for the Gartner Group Inc. in Stamford, Conn., says Systemhouse can continue to compete effectively against such big guns as Andersen, Electronic Data Systems Corp. and IBM—providing it sticks to its target markets. "If they don't try to be all things to all people," says Digrius, "they'll soon be nipping at the heels of the big guys." —*Don Marks*

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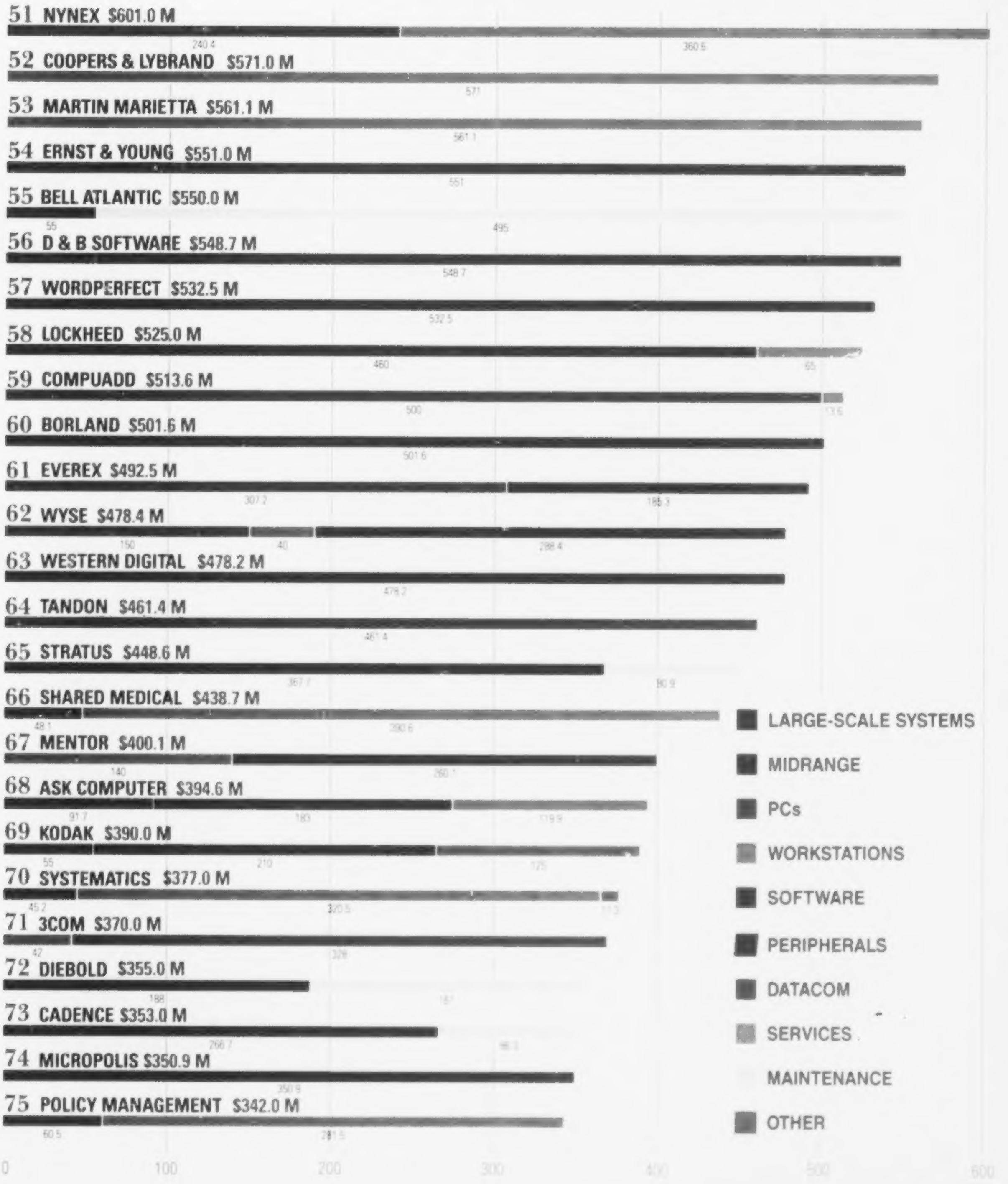
51 NYNEX $601.0 M
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53 MARTIN MARIETTA $561.1 M
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91.7
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119.9
69 KODAK $390.0 M
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210
125
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PERIPHERALS
DATACOM
SERVICES
MAINTENANCE
OTHER
0
100
200
300
400
500
600

IS Revenue **$601.0 Million**
NORTH AMERICA
51

NYNEX CORP.
335 Madison Avenue
New York, NY 10071
(212)-370-7510

For the last two years, NYNEX Corp. has been busy streamlining itself, stripping away businesses not considered part of its core competencies and downsizing its staff by more than 10%. That's the major reason the company's revenues from information systems, software, services and distribution dropped a substantial 33.8% from an estimated $1.3 billion in 1990 to $861 million in 1991.

Last June, NYNEX sold its 77 Business Centers to ComputerLand Corp., an action that resulted in a revenue reduction of more than $400 million. The Business Centers, which grossed $700 million in 1990, provided about $260 million to the regional Bell operating company (RBOC) for the first five months of 1991.

"From a strategic point of view [the sale indicates] we are getting away from the hardware and hardware distribution business....Our view is that is not where the margins are," says Paul Cosgrave, new president and chief executive officer of subsidiary AGS Computers Inc., NYNEX's largest software and consulting company.

Fundamentally, this move lets NYNEX focus squarely on the software and services side of the IS business. NYNEX's IS organization is really a number of small and medium-sized acquisitions completed within the last four years. (Within NYNEX regulated wireline services, there are software and integrated systems sales that would be defined as IS revenues. However, because they are so entwined with these communications services, DATAMATION at this time does not attempt to break them out.)

The IS companies include AGS Computers Inc., which itself comprises eight separate software and services companies. They variously specialize in general computer consulting and systems development; telecommunications and network management software; and applications software for financial services, communications and other vertical markets.

The BIS Group Ltd., AGS's U.K.-based counterpart, is made up of three separate companies. About 60% of its business is financial services software. NYNEX Computer Services Co. specializes in transaction-processing systems and such on-line applications as electronic payment systems for retailing and banking.

Last year, the revenue of these three groups of companies, which DATAMATION considers to account for NYNEX's IS revenue, dropped 2.8% to $601 million. This was due to a variety of factors. In particular, the recession figured heavily in their chief markets—the bludgeoned Northeast corridor, where many AGS clients reside; the United Kingdom, the BIS bastion; and financial services, which is the primary vertical market for the entire group.

NYNEX says that these pressures were offset by growth in software products sales. "Our greatest strength in 1991 was our ability to move some of our software companies into the international marketplace," Cosgrave says. For instance, AGS's Vista Concepts Inc. captured multimillion-dollar contracts at the Bank of Scotland and Australia Bank.

Outsourcing will also be a critical part of NYNEX's move into vertical markets, particularly in the area of application maintenance. This strategy was given a boost in 1991 when the Modified Final Judgment of the U.S. District Court allowed the (RBOCs) to offer data-processing services.

Finally, NYNEX announced alliances in 1991 to develop multimedia applications for government, hospitals and educational institutions—a harbinger of things to come in corporations where networks, information and information services are core competencies.—*Angeline Pantages*

IS Revenue **$571.0 Million**
NORTH AMERICA
52

COOPERS & LYBRAND
1251 Avenue of the Americas
New York, NY 10020
(212)-536-2000

Perhaps the most significant event of 1991 for Coopers & Lybrand was the appointment of Eugene M. Freedman as chairman of the Big Six accounting firm on October 1. One of Freedman's foremost objectives was to reorganize the staff by setting in place new national partners with a renewed emphasis on serving C&L's clients, overall needs.

That's where Ellen Knapp comes in.

The information technology partner for Coopers & Lybrand's Federal Government practice in Washington, D.C., for six years, Knapp was promoted then to the home office as National Director of Information Technology Consulting.

She sees her mission clearly: "To build the Information Technology practice in a way that ensures it plays a real role in responding to clients' business needs and not solely to provide technology solutions to technical problems."

She's building from a base in which worldwide IS revenue grew a modest 6% to $571 million in 1991. That's up from $539 million in 1990, the first full year after the merger with Deloitte Touche in the United Kingdom and Benelux countries. C&L says Coopers & Lybrand Deloitte is the largest accounting firm in the United Kingdom.

Strongly committed to industry specialization, Coopers & Lybrand provides management-consulting services to firms in a variety of vertical industry markets, including manufacturing, retail, telecommunications, health care, pharmaceuticals and financial services, as well as the federal government. C&L stresses industry expertise and specialization in its goal of forming strategic partnerships with its clients. With over 700 offices spanning 117 countries, Coopers & Lybrand has established such relationships with about 4,800 client firms worldwide.

On the technology front, Coopers & Lybrand in the United States boasts an Advanced Technology division which offers several object-oriented products, including a class browser and product enhancer for object-oriented databases.

In the software tools area, C&L has an agreement with Applied Business Technology Corp. to remarket Applied's Project Bridge as SUMMITBridge, an automated presentation and planning facility for Coopers & Lybrand's proprietary methodology.

C&L's worldwide initiative in reengineering has created the Business Process Reengineering's Breakpoint-BPR, a set of multidisciplinary ideas, methods and tools used to change core business processes so as to improve performance. Sparks, a workflow reengineering tool, is one of C&L's software products that support BPR.

Still going strong is a joint venture with IBM called Meritus, a consulting practice for computer-integrated manufacturing (CIM) aimed specifically at the pharmaceutical and consumer products industries.—*Steve Paul*

IS Revenue **$561.1 Million**

53

NORTH AMERICA

MARTIN MARIETTA CORP.

6801 Rockledge Drive
Bethesda, MD 20817
(301)-897-6000

Overall, Martin Marietta Corp.'s total corporate revenues dropped a hair, by 0.8% to $6.1 billion. Net earnings were down 4.4% to $313 million. But revenues from its Electronics, Information & Missiles Group—the division its IS business calls home—grew 2% to $561 million. Martin Marietta builds information systems for several military and civil government agencies, including the Air Force, the U.S. Postal Service and the departments of Defense and Housing and Urban Development.

The IS business was folded into the Orlando, Fla.-based electronics and missiles group in 1991. And, since the IS division now shares a balance sheet with Martin Marietta's military hardware operation, the IS division truly had a bang-up year—compared to the rest of the company. The military hardware operation fattened upon Strategic Defense Initiative (SDI) contracts and Patriot missiles, for which it is a prime contractor.

One of the nonmilitary reasons for the division's prosperity came from a new contract with the U.S. Postal Service signed last year. Martin Marietta will rebuild more than 500 machines that process large, flat pieces of mail, such as magazines and oversized envelopes. The company is also building 812 bar-code readers to process postal bar codes on that same large, flat mail, as well as new computerized label printer/applicators.

The company completed the first full year of work on a new nationwide information system for the Department of Housing and Urban Development in 1991. Most of the work involved tying existing workstations into a new mainframe-based system.

Facilities management contracts continued to pour cash into Martin Marietta's IS coffers last year. The company provides support services for software applications at the Social Security Administration's Baltimore data-processing center. The applications are used to issue Social Security cards, maintain earnings records and process benefit claims, handling more than 4.5 million transactions a day. Martin Marietta also handles data center management for Orange County, Calif.

And then there are the military contracts. If there was any worry about the peace dividend cutting into Martin Marietta's defense business in 1990, it certainly evaporated in 1991. The company began production of new test equipment for the Navy and the Air Force last year, as well as continuing work on SDI supercomputer-based battle simulations. Later this year, Martin Marietta will bid on a contract to develop a workstation-based battle simulator for the Army. —*Mike Ricciuti*

IS Revenue **$551.0 Million**

54

NORTH AMERICA

ERNST & YOUNG

787 Seventh Avenue
New York, NY 10019
(212)-773-3000

Ernst & Young is one of the several Big Six accounting firms that have begun to get very healthy returns on their information technology consulting practices in recent years.

Examples of Ernst & Young's IT Systems Planning and Delivery services include custom and package systems development, redevelopment engineering, systems integration, outsourcing and the Ernst & Young Navigator Series of development methodologies, which complies with IBM's AD/Cycle application development framework.

Last year, E&Y's IS consulting revenues grew by a very respectable 12.4% to $551 million. Total revenue for the firm reached $5.4 billion, an increase of 8%.

The growth came in great part from a strong increase in demand from large corporations struggling to make big changes in the way they use information technology. To help the firm better serve this growing demand, Ernst & Young last year merged computer-aided software engineering guru Vaughan Merlyn's CASE Research Inc. and brought Merlyn and his partner Greg Boone into E&Y's Boston Center for Information Technology and Strategy.

The Boston center also completed contracts for two major IT research studies last year, one on banking technology and the other on "Information Management and Japanese Success." The Center for Information Technology and Strategy is one of E&Y's two IS operations, the other being its Center for IT Planning and Delivery in Dallas.

Merlyn and company have been hard at work since early last year establishing a completely new practice for E&Y: Development Effectiveness. The program is aimed at helping companies improve their software development processes and lay the foundation for implementing advanced development technologies such as CASE, Total Quality Management and object-oriented programming and database management systems. Components of the new E&Y practice include Organizational Change Management, Continuous Quality Improvement and Process Innovation. During 1991, three U.K.-based companies and five U.S. corporations used E&Y's Development Effectiveness services.

The company also signed an agreement last year with Dun & Bradstreet Software Services Inc., which designated E&Y as one of three Big Six preferred installers selected for their financial, human resources and materials management software systems.

—J. William Semich

IS Revenue **$550.0 Million**

NORTH AMERICA

55

BELL ATLANTIC CORP.

1600 Market Street
Philadelphia, PA 19103
(215)-963-6000

Like most regional Bell operating companies, Bell Atlantic Corp. had a generally lackluster year due to the recession. Revenue declined a slight 0.15% to $12.28 billion, and the company took a mega loss of $222.7 million due to a one-time write-off of $1.55 billion to adopt a new accounting standard on health and life insurance benefits for retirees. That put them one step ahead of other large corporations, all of which have to comply by January 1, 1993. Still, even without the write-off, earnings would have declined 2.7%.

All that made the performance of Bell Atlantic's information systems and services subsidiary, Business Systems, shine a little brighter in comparison. According to Julie Dobson, vice president of planning and development, Business Systems reported an almost 15% gain in revenue over 1990's level. DATAMATION estimates that to be a rise from $480 million to $550 million.

Business Systems represents only the IS revenues from the nonregulated side of the business. Under the regulated Network Services side, there are sales of telecommunications software and integrated systems that would be defined as IS revenues. However, because they are so entwined with Bell Atlantic's communications services, DATAMATION at this time does not attempt to break them out.

The majority of Business Systems's revenue and growth was generated by the maintenance and support firm, Bell Atlantic Business Systems Services Inc., which was created in 1990 from the acquisition of Sorbus Inc. and Control Data Corp.'s third-party support activities.

In 1991, big IBM shops were the major target of Business Systems Services (BSS). According to Dobson, this operation achieved triple-digit revenue growth through contracts to maintain and support mainframe systems. "We are now supporting more than 200 IBM 3090s," she says.

BSS is apparently using the partnership strategy to storm IBM-dominated bastions. Last year, it inked separate agreements with Amdahl Corp. and NCR Corp. to provide single-source, multivendor services. In Europe, Bell Atlantic and ICL PLC have created a joint venture to offer maintenance services to multivendor sites. BA's European maintenance business has grown 30% annually in recent years (reaching about $200 million), and the alliance should provide it with a stronger presence there.

Another reason for BSS's growth in mainframe maintenance contracts, according to Dobson, are new account management and diagnostic tools for systems support, announced in 1991. One is the PC-based Service Edge system. It features a predictive service for diagnosing and alerting field-engineering staff of problems in IBM-compatible systems. It also sports an integrated database on service activity, as well as parts and machine inventories. Also announced was the Remote PSR service, which provides software information and problem management for large IBM systems.

Among major new Bell Atlantic alliances to watch this year is one with Electronic Data Systems Corp. to develop applications systems for the wireless industry. Another is with the Italian telecommunications holding company STET to develop software to improve the quality of telephone and wireless services. And a third is with Apple Computer Inc. and CHI Consulting to integrate Apple products with IBM environments.

—Angeline Pantages

IS Revenue **$548.7 Million**

NORTH AMERICA

56

DUN & BRADSTREET SOFTWARE SERVICES INC.

3445 Peachtree Road, Northeast
Atlanta, GA 30326
(404)-239-4636

Although Dun & Bradstreet Software Services Inc. had been making a cushy living off large, mainframe-based software applications, chairman John Imlay saw the handwriting on the wall late in 1990. And that handwriting spelled c-l-i-e-n-t/s-e-r-v-e-r.

The result? In 1991, the software

and services unit of financial services giant Dun & Bradstreet Corp. made a serious effort to develop svelte client/server versions of its human resources, financial and manufacturing software. "IBM mainframe growth was not great last year," says Imlay. "We had planned to bring out our first client/server products in 1993, but we accelerated development to get products out a year earlier."

Spending on development of those new products, combined with a slow economy and restructuring charges carried over from the 1990 merger of Management Science America Inc. and McCormack & Dodge Corp., which created D&B Software, dragged the company's operating income down more than 12% to $36 million. Revenue rose a paper-thin 1.8% to nearly $549 million.

To develop new applications quickly, D&B Software looked for experienced client/server help from the likes of Cognos Corp., Powersoft Corp. and Sybase Inc. The hope was to retain downsizing customers who may be considering venturing out of the fold.

Those first client/server products ship this month, and Imlay is looking to make back some of the money spent to build them. But D&B Software isn't putting all of its fiscal eggs into one client/server product basket. "We see our consulting services business and our international sales growing at a rapid pace, both for mainframe and client/server systems," says Imlay.

Despite the departure last November of executive vice president and chief technology officer John Landry, who codeveloped the WiJit technology on which the new client/server products are based, Imlay says future product plans are firmly on track. John Pepe, senior vice president of customer support and engineering, is taking up where Landry left off, says Imlay, in determining new product strategy.

Also, D&B Software quickly put the other WiJit developer, Massachusetts Institute of Technology professor Thomas Malone, on retainer to help the company build future products.

No doubt the slow economy, lagging mainframe sales and shifting customer base in 1991 have changed D&B Software forever. Imlay says that more client/server products will roll out over the next few years, eventually taking D&B Software completely away from its mainframe roots. "We will continue to support our mainframe products," he says, "but we will eventually replace them all with client/server products."

—Mike Ricciuti

IS Revenue 57 **$532.5 Million**

NORTH AMERICA

WORDPERFECT CORP.
1555 North Technology Way
Orem, UT 84057
(801)-225-5000

WordPerfect Corp. president and founder Alan Ashton says his company now concentrates on "word processing and communications"—primarily WordPerfect and the electronic mail and office automation package, WordPerfect Office.

Unlike rival Microsoft Corp., which makes many products for a few environments, WordPerfect Corp. makes fewer products for many environments. WordPerfect now runs on 15 platforms and has been translated into 17 languages. Sales outside the United States accounted for 40% of revenues, generated through 45 offices and distributors serving 90 different countries. WordPerfect Office runs on PCs and Macintoshes. And to enhance communications, the company also produces various gateways, print servers and translators.

At first blush, it would appear that this approach has panned out. In 1991 WordPerfect increased its staff by almost 22%, adding 520 employees to reach 2,896 worldwide. And total revenue rose 17.7% to $532.5 million. That growth, however fell short of the company's own prediction that it would grow 33% to top the $600 million mark in 1991 and was far behind 1990's 60.7% revenue spurt.

One factor behind the shortfall in expectations may be that WordPerfect did not anticipate the rapidity with which demand for Windows applications would supplant demand for plain DOS applications. The company has been admittedly tardy in implementing a Windows strategy. WordPerfect for Windows, introduced last year, produced $53 million in revenue by year's end. WordPerfect For DOS, however, still contributed the lion's share of revenues, some $307 million for the year.

The company introduced nine other new products and upgrades in 1991, including versions of WordPerfect for Macintosh, NeXT and VAX operating systems. An AS/400 version came out this spring, and one for Go Corp.'s PenPoint operating system is promised this month.

Privately owned WordPerfect has always kept its inner workings to itself. And why not? It has never had to sell stock or borrow money in 13 years of operation. However, a management shakeup in March of this year—possibly the first in its history—opened the door a bit. Pete Peterson, executive vice president, exited the company, and the board of directors was both expanded and removed from day-to-day management.

"In the past, there was quite a bit of reluctance to go out and give technical help and assistance to corporations," Ashton admits. "We want to be more responsive to large customers, especially ones with cross-platform and messaging/mail needs."

Moreover, "in the past, we have not been as willing to work with other companies and make alliances," Ashton adds. An example of the new attitude is its WordPerfect Works communications module, OEMed from Magic Soft.

For the future, Ashton intends to

offer more products sporting graphical user interfaces. A UNIX version of WordPerfect running under the Motif GUI is in beta, a native mode version of WordPerfect For OS/2 is in the works and even a GUI DOS version is planned. Ashton promises to keep implementing the latest capabilities in DOS versions of WordPerfect's products. And "watch for us at fall COMDEX," he says. "Some exciting things will be happening."—*Lee Thé*

IS Revenue **$525.0 Million**

58

NORTH AMERICA

LOCKHEED CORP.

4500 Park Granada Boulevard
Calabasas, CA 91399
(818)-876-2000

Lockheed Corp.'s IS business is CalComp, the Anaheim, Calif., maker of computer graphics peripherals, including plotters, color printers and digitizers. During 1991, CalComp introduced nine new products in all areas and acquired a U.S. computer graphics distributor to improve its competitive fortunes. The result was 25% revenue growth during 1991 to $525 million.

As the company had hoped, CalComp's array of new offerings brought its product lines closer to the demands of the marketplace. Fully half of CalComp sales during 1991 came from new products. To provide more effective access to its markets, CalComp acquired Access Graphics Technology Inc., a distributor of computer graphics peripherals and workstations.

During the year, CalComp formed its Team 90 program, a cross-functional group including engineering, finance, manufacturing, product assurance and supplier operations, all bent on shortening the product development cycle. CalComp also launched programs to improve customer service and manufacturing efficiency. In addition, the company established subsidiaries in Austria, Australia, China and Taiwan. Finally, CalComp's Hudson, N.H.-based operation ceased its efforts in the display market. The Display Product Group was renamed the Electronics Manufacturing Group at the start of 1992 and will sell manufacturing and design services.

Overall, Lockheed Corp. revenue dipped 1.6% to $9.8 billion, as net earnings fell 8% to $308 million. And, while one would expect defense cutbacks to be the culprit, at least part of the problem, according to Lockheed officials, was an increase in Lockheed's effective tax rate to 35% from 22%.

Lockheed's IS business is a result of commercial expansion during the early 1980s, when the defense business was going strong. Much of this expansion was sold off in the late 1980s to get corporate finances under control. But, as soon as the housecleaning looked complete, the once high-flying defense side of the business took a nosedive as Eastern Europe changed the course of history. CalComp is now not only Lockheed's sole IS property but an important hedge against the corporation's less predictable defense and aerospace properties.—*Bill Sharp*

IS Revenue **$513.6 Million**

59

NORTH AMERICA

COMPUADD COMPUTER CORP.

12303 Technology Boulevard
Austin, TX 78727
(512)-250-1489

CompuAdd Computer Corp. hit the ground running in 1991, completing a rush Defense Department order for some $30 million worth of computers for Operation Desert Shield. Despite a relatively short lead time and only 30% of the parts in inventory needed for the order, CompuAdd delivered the equipment on time.

The government didn't forget. In November, it awarded its friend in need the Desktop IV contract, an estimated $398 million PC deal. However, that contract is currently tied up by a protest from other companies that had also bid on the project. If the PC clone maker had had the contract in hand, its sales would likely have hit close to the $1 billion mark for the year.

Sans the contract, the privately held CompuAdd still did well, garnering revenue of $513.6 million. Unlike in previous years, that figure doesn't include revenue from CompuAdd Express, a company spun off last year to handle mail order sales, so year-to-year revenue comparisons are irrelevant.

The number of the company's retail operations grew in 1991, jumping from 88 locations in 1990 to 120 by the end of the year. CompuAdd's retail division has sold only CompuAdd computers and selected peripherals in the past, but this year it will begin selling Apple Computer Inc.'s Macintosh line, making CompuAdd one of Apple's largest resellers.

And early this year, CompuAdd again rubbed salt in the wounds of the big boys in the computer industry when it beat out IBM and NCR Corp. for a $53 million cash register contract from Sears, Roebuck and Co. CompuAdd wowed Sears by demonstrating working prototypes of its point-of-sale terminal within days of sending out the proposal. The 28,000 terminals are based on Intel Corp.'s 16-megahertz 386SX microprocessor.

Unlike many of its clone competitors, CompuAdd derives 90% of its revenues from domestic sources. That may change this year, as CompuAdd chairman and chief executive officer Bill Hayden, after having spun off CompuAdd Express last year, again divided the CompuAdd corporation into several smaller operating units in 1992.

Hayden, a devotee of the Smaller-Is-Better school of management, has divided the company into two autonomous divisions, one to handle the company's retail stores and international markets, and the other to focus on large business and government accounts. Managing these tightly focused units will be two new executives. James H. Moore from Texas Instruments Inc. will handle the Retail/International Division, while John L. Conn, formerly of Harris Corp., is general manager of the Systems and Technology Division.

In addition, the company spun off CompuAdd Information Systems as an independent entity in March of 1992. Intended to do custom programming for large firms, the spinoff's first customer is Sears. It's providing programming for the retailer's brand-new POS terminals.

CompuAdd's success with large orders should not be a big surprise. The company's PCs have always done well in most reviews. And the firm got another feather in its cap last year when San Jose-based Dataquest Inc. ranked CompuAdd first among PC manufacturers in its user satisfaction survey.—*Bob Francis*

IS Revenue **$501.6 Million**

60

NORTH AMERICA

BORLAND INTERNATIONAL INC.
1800 Green Hills Road
Scotts Valley, CA 95066
(408)-438-8400

In the depths of the ocean lives an amazing creature called the gulper eel, which can swallow fish as big as itself. PC software vendor Borland International Inc. followed this example last fall by gobbling up database software vendor Ashton-Tate Corp. Borland immediately doubled in revenue to $501.6 million, catapulting Borland onto the North American DATAMATION 100 for the first time.

The downside of this bold move was a $116 million acquisition cost during 1991, resulting in an $80.7 million net loss for that year. The company also had to integrate the nearly half of Ashton-Tate's 1,600-person staff that was kept on. That brought total employees to 1,950 by year's end.

"We didn't add anybody from Ashton-Tate's executive suite," pointedly remarks Philippe Kahn, Borland's president and chief executive officer. Borland's top management roster has been stable for years.

Ashton-Tate has a longstanding lawsuit in which it has been vigorously defending its dBase product against Fox Software Inc., maker of FoxBASE. Borland, too, has a dBase product, which complements Borland's Paradox database products. Of course, the best protection from a litigious company is to buy it, but Kahn says that in acquiring Ashton-Tate, primarily "we bought distribution channels for our upcoming technologies"—especially internationally, whence 50% of Borland's revenue now comes.

In any case, Borland wasn't just buying products when it bought Ashton-Tate. Not only has Borland been developing its own dBase product for years, but research and development expenditures remained a healthy 12% of revenue, totaling $61 million in 1991.

Calculated risk-taking has characterized Borland since Kahn founded it in 1983. Its first product, the Turbo Pascal programming language, pitted the start-up against Microsoft Corp. and other established vendors.

Another core value has been the fact that, like Microsoft, Borland produces applications with its own development tools. To this Kahn adds a fillip even Microsoft can't equal: "In 1989, we decided to start all our new generations of products from scratch in Borland C++"—the company's premier object-oriented programming language. "Lotus and WordPerfect did quick ports [to Windows], and aren't doing so well. It took us more time. But when we ship, it'll be great. Updates will happen more quickly, too."

Those new generations of windows applications created with object-oriented code include the Quattro Pro For Windows spreadsheet and Paradox For Windows relational database (along with a revised DOS version) due this summer. Those are slated to be followed by dBase For Windows later this year. Borland will also be producing OS/2 products, as well as continuing to update its DOS software.

In the long run, the biggest impact of the Ashton-Tate acquisition may turn out to be the Interbase family of scalable database engines, including a multiplatform server, which competes to some extent with Microsoft SQL Server. Borland has moved most of the Interbase development team from Boston to its Scotts Valley, Calif., headquarters.

Borland is using the Interbase products to strengthen its database back-end capabilities, to provide for a high level of interoperability between Borland (and others') applications and development tools, and to make a place for Borland's products in multivendor UNIX and VAX networks in UNIX and VAX environments.—*Lee Thé*

IS Revenue **$492.5 Million**

61

NORTH AMERICA

EVEREX SYSTEMS INC.
48431 Milmont Drive
Fremont, CA 94538
(510)-498-1111

Everex Systems Inc. rose from the dust of three money-losing quarters in 1991 to regain profitability in the fourth quarter. In early 1991, chairman/founder Steve Hui recruited president Harold Clark from giant distributor Ingram Micro Inc. Clark immediately set forth to control costs while at the same time rebuild Everex's personnel, product and distribution structure. Meanwhile, Hui dived into the labs to create personal computer products bristling with patentable innovations.

Both succeeded, and in the process refocused Everex from a domestic PC systems maker with industrial-strength products for value-added resellers to one much more dedicated to retail sales and the international market.

One quarter of profitability was not enough to pull Everex into the black for the year; the company ended 1991 with $31.4 million in red ink, building on its $800,000 loss the previous year. But revenue rose 15.2% to $492.5 million, a considerable improvement over the previous year's 6.4% gain.

Clark did some cherry picking from among the many companies he'd worked with while at Ingram and brought in some key marketing and financial executives. The team's cost control measures reduced engineering costs from 10% of sales to around 4%, mainly by removing duplicated staff functions, eliminating a number of peripherals product lines and simplifying each product line.

At the same time, distribution underwent a Big Bang—out from Everex's traditional base of value-added resellers into major retail chains at home and abroad, both high-end and mass market (the latter with the new low-cost MaxLogic PCs). International sales doubled—to 20%—by increasing distribution into established markets and by expanding into new territories. Everex's thrust into the retail channel became even more evident last month, when the company announced that it had agreed to acquire mail-order PC supplier Northgate Computer Systems Inc.

By the spring of 1992, Hui's group had produced several new lines of technologically impressive, internally developed servers and notebook PCs. For example, the Carrier line of notebooks features removable hard disks and batteries.

Due this summer is perhaps the world's first Intel-based multiprocessing server with a patented fault-tolerant design that lets it run any box-stock PC operating system, including MS-DOS, NetWare and UNIX.

Another patented result of Everex's $28.8 million research and development budget is a tape backup due this month that is, as Clark puts it, "about three times as fast as anything on the market for one-third to one-half the cost." Coming up, he adds, are "pen-based multimedia PCs with accelerated graphics, [and] comarketing projects in important niche areas." As Hui puts it: "Our aim is to develop products that run industry standard software in innovative ways." *—Lee Thé*

IS Revenue **$478.4 Million**

62

NORTH AMERICA

WYSE TECHNOLOGY INC.
3471 North First Street
San Jose, CA 95134
(408)-473-1200

Wyse Technology Inc. spent 1991 further distancing itself from the clone image that nearly did it in two years ago.

After a group of Taiwanese investors called Channel International Corp. rescued it from huge losses in 1990, the now-private Wyse says it has been profitable for most subsequent quarters. It's climbed back into the black by concentrating on three core businesses—terminals, PCs and a new line of multiprocessor servers—and by continuing to build relationships with key value-added resellers and original equipment manufacturers.

That strategy produced revenue growth of 4% to $478.4 million, according to DATAMATION estimates.

Accounting for between 50 and 60% of sales, Wyse's terminal business grew last year with the addition of several new models. In October, Wyse launched a new line of low-emission models designed to conform to tough Swedish guidelines. The company also rolled out a color terminal for under $1,000 and a family of X terminals that met with favorable reviews. According to a study done by the Framingham, Mass., market research house International Data Corp., Wyse is the largest independent supplier of terminals worldwide and has an installed base of 3 million.

The success in PCs at closely held Wyse is harder to measure. There was no shortage of new product announcements: the company launched a full range of 386- and 486-based Decision desktop models, in addition to a number of notebooks. But Wyse may have lost some market share as it worked at getting costs under control. "In the PC area, we did see some decline in business, but our margin has been improving somewhat," says Daniel Wu, company president.

By getting high-performance products to market faster and by controlling costs, Wyse hopes to regain its former strength in PCs. Wu points to the recent launch of one of the first systems based on Advanced Micro Devices Inc.'s new 40-megahertz chip as proof that his company can move quickly to get products out the door.

The real future of Wyse probably lies more in its developing line of multiprocessor servers, introduced in 1990. The family now spans the entry-level series 5000i, the middle-range 7000i and the high-end series 9000i, which can include up to eight 486 processors and support as many as 250 users. "In advanced systems, we are talking about continuous high growth in the triple digits," says Wu, who attributes this success to the company's focus on lower-priced systems relative to competitors, such as Compaq Computer Corp. or NCR Corp. "In the current economic situation, the higher end gets hurt more than the medium end," he says.

The company's focus on systems software in the inherently complex world of UNIX may also be helping keep margins up. A member of UNIX International Inc. and the MP UNIX Consortium, Wyse was able to become one of the first companies to ship systems last year based on the new multiprocessor implementation of UNIX System Laboratories Inc.'s UNIX System V release 4. Similarly, Wyse is now working with Microsoft Corp. to fine-tune the multiprocessing capabilities of the upcoming Windows NT operating system.—*Paul Pinella*

IS Revenue 63 **$478.2 Million**
NORTH AMERICA

WESTERN DIGITAL CORP.

8105 Irvine Center Drive
Irvine, CA 92718
(714)-932-5000

Last year was a year of decision for Western Digital Corp. Shaken by intense price competition and declining profit margins in the desktop storage market, this almost billion-dollar manufacturer of disk drives, board-level products and semiconductors found itself forced to make dramatic changes to both its marketing strategy and its product offerings. Judging from the company's performance so far in 1992, it appears to be an organization that works well under pressure.

The most important change Western Digital made in 1991 was to streamline its volatile value-added reseller channels and concentrate instead on developing stable, long-term relationships with original equipment manufacturers and strategic partners. Although the company has no plans to abandon its current VARs, the new thinking is that only computer manufacturers can provide the secure, high-volume agreements needed to stabilize the company's cyclical and cash-hungry PC storage business. Disk drive sales currently generate approximately two-thirds of Western Digital's annual IS revenue of $478.2 million, a 3.9% increase from 1990's level.

In the storage controller, systems logic and video-imaging markets, which together constitute the remaining third of the company's IS business, an industrywide shift to tightly integrated, small-footprint desktop systems and portable computers severely dampened demand for Western Digital's board-level products. Worse, the firm's capital-intensive transition to manufacturing those components as chips, rather than boards, which began in 1990, hasn't restored these businesses to their previous volume levels. In October, a need for cash precipitated the sale of the company's local area network adapter card products to Standard Microsystems Corp., taking Western Digital out of the networking business entirely—at least for the time being.

Needless to say, all of these changes took their toll on the corporate balance sheet. After breaking the billion-dollar barrier in 1990, Western Digital's revenue for 1991 slid back to $916 million, a decline of 14% from the previous year. The company also took a pretax restructuring charge of $81.5 million—attributable primarily to staff reductions and write-downs of older technologies—and ended the year with a whopping $95.5 million loss.

Perhaps the most significant financial achievement of 1991 was the successful restructuring of the company's hefty $206 million worth of debt. According to Alexa McCloughan, a storage industry analyst with International Data Corp. in Framingham, Mass., debt restructuring bought Western Digital time to put its new OEM-focused strategy to work. Says Bob Blair, Western Digital's vice president of corporate communications, 76% of the company's fiscal 1991 revenue came from OEMs, and the percentage continues to rise.

"Over the last 12 to 18 months," Blair says, "we've significantly increased the amount of OEM business we do with large market-share PC vendors such as IBM, Gateway 2000, Tandy, Olivetti and others." IDC's McCloughan believes that Western Digital could soon announce strategic partnerships with a few major PC manufacturers, involving both its drives and chips, perhaps within the next six months.

Western Digital's core products apparently haven't suffered any permanent damage from the firm's fiscal woes either. According to McCloughan, the company's Caviar and Piranha series of medium-capacity (80, 100 and 200 megabytes) 3.5-inch drives have been selling vigorously throughout the first half of 1992. "The market for mainstream disk drive products has really picked up in the last six months," says McCloughan, "and suddenly Western Digital has an incredible product in a very hot market."

Western Digital's Blair agrees. "Some of the fundamentals in the storage market have improved notably," he says. "The double-digit, month-to-month price erosion we saw in 1991 has slowed, and our margins have improved." Both Blair and McCloughan speculate that—barring anything unforeseen—Western Digital could return to profitability as early as mid-1992.—*Don Marks*

IS Revenue 64 **$461.4 Million**
NORTH AMERICA

TANDON CORP.

301 Science Drive
Moorpark, CA 93021
(805)-523-0340

Tandon Corp.'s drive into the crowded U.S. PC market was a success last year from a sales standpoint, but those sales did not translate into profits.

In 1991, Tandon's revenue rose 4.9% to $461.4 million. But, after last year's brief visit to the land of black ink, the company was back in the red, with an operating loss of $8 million. Restructuring and inventory revaluation added about $40 million on top of that, leading to a net loss of $48 million.

Despite the free-flowing red ink, Tandon made some big strides in the U.S. market last year, garnering 21% of the company's total sales in the United States, up from 7% in 1990. Europe remains the company's primary market, however, where it still does 77% of its business, and it's facing increasing competition there from the likes of Commodore International Ltd., Compaq Computer Corp., Dell Computer Corp. and IBM.

But there's little doubt of the company's dedication to the U.S. PC market. Last year, the company snapped up two PC manufacturers, PC Brand Inc. in the second quarter and Positive Corp. in the third quarter. PC Brand is Tandon's ticket into the fast-growing mail order PC market, whereas Positive gives Tandon even more access to the retail channel. Positive sells its PCs through warehouse clubs, such as Kmart Corp.'s PACE Membership Warehouse Inc., The Price Co.'s Price Club warehouses and Sam's Club Division of Wal-Mart Stores Inc. Tandon's own line of PC products are sold primarily through dealers, value-added resellers and the company's field sales force. The heads of Tandon's various PC lines all report to Ranjit Sitlani, executive vice president of Tandon.

Tandon's major new products last year included the introduction of a modular line of PCs called Option, aimed squarely at corporate IS purchasers. The Option line allows users to upgrade the central-processing unit and memory by replacing a cartridge in the front panel of the PC. In addition to the Option, Tandon introduced the PacII computer, which features an interchangeable portable hard drive. The PacII is aimed at users concerned about data system portability, security and drive capacity. The company also entered the fast-growing notebook PC market with the 20-megabyte Tandon NB/386sx. A version with more memory was intro-duced later in the year. —*Bob Francis*

IS Revenue **$448.6 Million**

65

NORTH AMERICA

STRATUS COMPUTER INC.

55 Fairbanks Boulevard
Marlborough, MA 01752
(508)-460-2000

Every time AT&T exhorts customers to "reach out and touch someone," Stratus Computer Inc. executives smile. In 1991, telecommunications firms provided much of the impetus for Stratus's revenue gains, which rose a solid 11.1% to $448.6 million. As telecommunications firms continue to expand the services they offer, they require more and more fault-tolerant computing power. Stratus grew its budding telecom business 70% last year, and it now represents about 21% of Stratus's revenue, says Gary Haroian, corporate vice president and general manager of corporate operations. No wonder that Stratus will continue to focus its strategy on worldwide telecom customers.

Those telecom customers demand UNIX-based systems, and that generally means an equivalent demand for reduced instruction set computing platforms. Last year, the company shipped the first models of a new line of RISC-based computers, called XA/R, which were announced in 1990. Stratus is expected to introduce multi-processor models this year, but it won't have a full XA/R line until 1993. By then, however, the company plans to replace its entire proprietary XA/2000 complex instruction set computing line with the reduced instruction set computing machines. Revenue growth, which slowed from 1990's 18.3%, reflected this product transition.

A comprehensive XA/R line should provide some steam for Stratus's many original equipment manufacturer, value-added reseller and distributor partnerships, including its OEM deals with LMEricsson Telephone Co. and NEC Corp., both of which have contracted to sell only RISC systems. Although Stratus forged these partnerships in 1990 and has high hopes for them, the company has realized virtually no revenue from either of them to date, due in part to the XA/R ramp up.

IBM, Stratus's largest OEM, continues to disappoint, accounting for 18% of sales, down from 23% last year. Haroian admits that reselling Stratus systems (under the IBM System/88 banner) is "not a priority" for Big Blue. Despite rumors to the contrary, Stratus intends to stick with the relationship, but forecasts that IBM will continue to provide it with flat or declining revenues. However, analyst Steve Weber, managing director of Cowen & Co. in Boston, raises the question of whether IBM may replace the System 88 with a fault-tolerant system of its own.

Apart from that question, Stratus is well set for the future. In an effort to boost profits, which in 1990 were up only 4.5% over 1989's level, the company in 1991 reduced its cost structure—and, unlike most Massachusetts systems vendors, it did so without reducing its work force. The company implemented a reorganization, announced in late 1990, in which it delegated profit and loss responsibility to autonomous international, telecommunications and domestic sales divisions. A remarkable 34.3% earnings hike resulted, bringing profits to $49.7 million. Along with telecom, the international division was largely responsible for this improved performance. It garnered sizable sales to banks, such as France's Credit Lyonnais. Haroian notes as well that Stratus systems now run in almost every major airline in the world.

Haroian cautions, however, that while revenue growth is indicative of future performance, such a jump in earnings is an anomaly resulting from 1991's stringent expense controls. He forecasts more subdued earnings growth in the future.

—*Elaine L. Appleton*

IS Revenue 66 $438.7 Million
NORTH AMERICA

SHARED MEDICAL SYSTEMS CORP.

51 Valley Stream Parkway
Malvern, PA 19355
(215)-296-6300

Last year, Shared Medical Systems Corp. continued a turnaround that began late in 1989 with the announcement of totally revamped hospital information systems for IBM and Digital Equipment Corp. users. Total IS revenues increased 8.8% to $438.7 million, building on the previous year's 3.4% rise. The results from service and system fees (exclusive of the hardware sold when SMS provides an integrated system) are slightly better, up 9.4% to $390.6 million. And net earnings rose a healthy 11.5% to $25.3 million, a welcome change from 1990, when earnings dipped slightly.

According to Stephen McClellan, Merrill Lynch & Co. Inc. first vice president and veteran software and services analyst, the turnaround is a result of more than the new products and services. "There have been management and sales force reorganization, and the hospital scene is more sanguine than normal. Hospitals are willing to spend more money on capital projects. For five years, they were just trying to survive, and now they are playing catch-up...The prospects have not been this good in the last eight years."

The premier SMS system is the IBM mainframe-based Invision, which is offered either for in-house use or as a remote-computing service. Since 1989, more than 80 new hospitals have signed up, including 35 in 1991; another 190 customers have upgraded from the previous system, Independence. A particularly positive development with Invision is a return to a trend reminiscent of the 1970s: more hospitals (80% of new clients) are opting for remote data processing, linking to SMS's data centers rather than employing an on-site installation. This, says McClellan, means more recurring revenues and profits for Shared Medical.

That arrangement is also better for the customer, says SMS vice president of administration Michael Costello. "Financially, remote computing has always been the more attractive option, but emotionally, hospitals, which have a large capital investment in the data center and staff, have had a difficult time letting go. Also, shared systems fell into disfavor in the mid-'80s, when personal computers proliferated in health care."

In addition to the Invision gains, Costello says, several units had a strong year, particularly the professional services and international divisions. While the firm has operated abroad for 10 years, international sales went into high gear in 1991, increasing 40% to $53 million.

Among other key events of last year, perhaps the most far-reaching is the new SMS strategic alliance program. Six hospitals signed up for the program in 1991, committing capital investment funds into the program for new applications development. Many applications will focus on hospital records automation, where, McClellan says, SMS is aiming to be the leader within the next two or three years.

Two key technologies for the on-line medical record business are document imaging and diagnostic imaging. SMS already has a document-processing system in the prototype stage. A few years away is the more complex on-line diagnostic imaging, which demands high-quality computerized axial tomography (CAT-scan), magnetic resonance imaging (MRI) and other images that a radiologist can rely upon.

Focusing on larger customers and contracts, Shared Medical also trimmed away two businesses in 1991: its Canadian subsidiary and the physicians practice management business, a processing service. However, the firm continues to offer the turnkey Signature system for physicians.

—*Angeline Pantages*

IS Revenue 67 $400.1 Million
NORTH AMERICA

MENTOR GRAPHICS CORP.

8005 Southwest Boeckman Road
Wilsonville, OR 97070
(503)-685-7000

Mentor Graphics Corp. was more than a day late and a dollar short last year. The supplier of electronic design automation software entered 1991 already 12 months behind the original delivery schedule of release 8.0 of its Falcon Framework For Concurrent Design software. Mentor met with weakened market demand for computer-aided engineering software of all kinds. Consequently, the company ended the year with an 8.1% drop in revenue to $400.1 million and a $61.6 million loss, compared with 1990's $23.6 million profit.

Despite the grim financial report, many analysts remain bullish on the company, convinced that the bad news at Mentor is history. For starters, Mentor was able to begin a phased shipment of release 8.0 for certain platforms, including Sun workstations, which began to ship last summer.

Realizing that it had spread its resources too thin, the company bit the bullet in the third quarter and bailed out of developing the computer-aided software engineering (CASE), mechanical design and documentation products that fit into the Falcon Framework. Although 35% of its revenue came from bundling its software with third-party workstations last year, Mentor is also moving out of the original equipment manufacturer hardware market.

Mentor refocused on integrated circuit design and concurrent engineering, leaving CASE and other secondary markets to a growing number of third-party suppliers, whose software works with Mentor's under the company's OpenDoor Partner program.

The shift took its toll, however. Mentor reduced its work force by 15% and took a $27 million, third-quarter write-off for restructuring. But for the fourth quarter, Mentor rebounded slightly and reported a slim profit.

Even during a year that the company would rather forget, there were bright spots, including a solid market reception of the IC products Mentor acquired two years ago when it bought Silicon Compiler Systems. "Strategically, [the acquisition] was absolutely one of the best things we've done," says Thomas H. Bruggere, chairman and chief executive officer.

Approximately 52% of Mentor's 1991 revenue came from outside the United States, and its international business looks solid. The company's business in Japan increased substantially last year, positioning it to capitalize on Japan's consumer electronics industry, now beginning to make more use of IC software. "A significant part of the computer industry is happening [in Japan]," says Bruggere, who expects fast growth after the current downturn in the Japanese economy. And, in Europe, Mentor scored a coup last fall when it signed a nonexclusive marketing pact with Siemens-Nixdorf Informations systeme AG, beating out competitor Cadence Design Systems Inc.

Other positive developments for the year included big contracts. In February, Mentor announced a three-year, $15 million deal with Intel Corp. for its electronic design automation tools. A contract with Motorola Inc. was reached in May that could eventually exceed $50 million. And last June, the U.S. Air Force signed a $2.2 million order, Mentor's largest sale ever to a government agency, to maintain and update computer resources for F-16 weapons systems.

Mentor is already working on release 8.1 of the Falcon Framework for some workstations, and it is well along toward porting the remainder of its tools this year to seven workstation platforms. A version for IBM's RS/6000 is scheduled to ship in the third quarter of 1992.

Bruggere is pinning his hopes on the future. "The key thing in 1991 for us—other than the fact it's over—was our shipping of release 8.0. We've gone from a situation in 1990 of supporting one platform to 1992 and supporting seven. We feel pretty good about things in that regard."—*Paul Pinella*

IS Revenue **$394.6 Million**

68

NORTH AMERICA

ASK COMPUTER SYSTEMS INC.

2440 West El Camino Real
Mountain View, CA 94039
(415)-969-4442

After ASK Computer Systems Inc. acquired Ingres Corp. in 1990, the company essentially squeezed the database software maker into its own management organization, thereby creating a single sales, support and product development function. Although this strategy allowed ASK's executives to pinpoint and fix problems affecting Ingres, it also delayed important decision making and created little synergy in sales.

So last summer ASK officials under chief executive officer Sandra L. Kurtzig shifted organizational gears and broke the company into three independent business units: ASK Computer Systems, responsible for traditional minicomputer manufacturing applications and for development of a new line of client/server-based products for UNIX; Data 3, focused on integrated manufacturing applications for the IBM AS/400 market; and Ingres, ASK's database and productivity tools component.

The new game plan seems to be working. Corporate revenue for the year, while naturally up due to the acquisition and greater-than-expected growth in the Ingres division, increased 58% to $394.6 million. Unfortunately, this achievement was blemished by a $57.6 million loss due largely to a $63.3 one-time write-off for goodwill and purchased intangibles related to both the Ingres and Data 3 Systems Inc. acquisitions. Analysts attributed the loss to an accounting albatross left over from ASK's preference to make cash, rather than stock swap, acquisitions. Most predict it will have little impact on future business.

The recession did take a bite last year out of ASK's bread-and-butter manufacturing resource planning (MRP II) software; sales were flat for the MANMAN and MAXCIM applications. But this was offset by gains in Europe from the other two units' database and AS/400 software. Ingres, in particular, sharply rebounded from the general slump that plagued many database companies in 1990. "We will do $250 million [in Ingres software] by June," says Kurtzig. "And that's pretty healthy growth."

To get growth back on track in its core manufacturing base, ASK is counting on Advance, its next-generation client/server manufacturing software based on UNIX and the Ingres database. Over a year late, the preliminary general ledger release went beta in early 1992. Customer shipment is now scheduled for first quarter 1993. Kurtzig attributes the delay to unforeseen networking challenges and customer uncertainty in moving critical manufacturing from proprietary minis to workstations. "Advance is late," she admits. "But that's because it's very hard to define exactly what people want."

Despite the delays in Advance, few analysts seem worried over the company's long-term prospects. The reason: manufacturing companies as a rule tend to be conservative in terms of data processing. So, even if the switch from minis to workstations takes several years, ASK can use the time to perfect its code.

Is another acquisition in the cards for 1992? "The straight answer is no," says Kurtzig. "But there are a lot of people coming to us who want to be acquired. And we are in an interesting position."—*Paul Pinella*

IS Revenue $390.0 Million

69

NORTH AMERICA

EASTMAN KODAK CO.

343 State Street
Rochester, NY 14650
(716)-724-4000

A picture may be worth a thousand words, but Eastman Kodak Co.'s is still a little out of focus.

Kodak has dabbled in many information businesses, but success has been elusive. Now the film and copier company hopes a clearer strategy is emerging as the dust settles from a restructuring whose billion-dollar cost consumed 1991's 2.7% increase in revenues, which topped $19.4 billion, leaving a massive $688 million loss.

Kodak entered last year with its diverse information businesses tied together into a new Commercial Imaging Group in an effort to sharpen both focus and margins. By November, a further restructuring had combined the microfilm, copier and related information segments in a new Office-Imaging subdivision of the group.

DATAMATION estimates Kodak's IS revenues—from electronic information processing, storage and retrieval businesses, and from sales of printers—at $390 million in 1991, an increase of 11.4% over 1990's level.

A broad strategy is in place: Kodak will leverage its consumer products technology into the office to capture, store, retrieve, reproduce and distribute data and images.

To this end, Kodak has stepped back from proprietary systems. It intends to blend its own image-capture, printing, copying and distribution with other vendors' workstations and retrieval products into a number of hybrid products spanning many technologies, from optical storage discs to PC network-linked printers that double as copiers. Indeed, the latest digital copiers can be programmed to edit or personalize copies; with floppy disks they can process a mailing list.

One such hybrid product, the Photo CD, should come to market later this year. Although a consumer product, it is expected to be used by busineses for storing, manipulating and distributing information. But first the high costs of putting images on a disc, and making copies of the disk must be brought down, says David A. Nadeau, the imaging group's director of sales operations for North America.

Criticism that Kodak has lacked a coherent approach to information systems brings forth the explanation that it is dealing with many niche markets. Nevertheless, Nadeau believes the company must invest more, and put more emphasis on the information segment if it is to remain, as it is in Kodak's view, the dominant player in the business-imaging market. —*John Morris*

IS Revenue $377.0 Million

70

NORTH AMERICA

SYSTEMATICS INFORMATION SERVICES INC.

4001 North Rodney Parham Road
Little Rock, AR 72212
(501)-220-5100

A merica's banks might be in trouble, but their troubles mean increased revenue for outsourcing firms, as banks turn to them to cut data-processing costs. Systematics Information Services Inc., which sells a suite of banking software and provides both in-house and off-site outsourcing, has found this environment much to its liking.

Revenues leapt up 47.8% to $377 million in 1991. Most of that—85%—comes from Systematics's outsourcing business. Only 12% comes from software and a mere 3% from other sources.

And business was up sharply in 1991, spurred by some large contracts. Systematics penned a five-year, $80-million facilities management contract with Federal Home Loan Bank Of San Francisco, and it took over the data-processing operations of Decatur Federal Savings and Loan, one of the largest S&L's in Georgia.

Systematics does almost all of its business in the United States, but in October it signed a three-year, $6.7 million contract to provide its Virtuoso cellular telephone-billing system software to Unitel Personal Communications in London.

Increased business in outsourcing, however, means increased costs, and Systematics's operating income didn't rise quite as sharply as its revenues. A wholly-owned subsidiary of Alltel Corp., Systematics reports 1991 operating income of $39 million, up 14% from the previous year's level. That slow growth relative to its revenue is a direct consequence of absorbing new business. When Systematics wins an outsourcing contract, it often purchases the bank's computer system and shifts some of the bank's data-processing employees to its own payroll. Systematics added slightly more than 1,000 employees in 1991, an increase of over 30%. It's sort of like trying to swallow a watermelon whole.

Systematics closed out the year with a major acquisition that should strengthen its position in the mortgage-servicing section of the market. In December, it arranged to acquire Computer Power Inc., a Jacksonville, Fla.-based company that provides data-processing services for mortgage-lending institutions. Computer Power earns revenues of about $100 million a year. The deal was completed in the first quarter of 1992 for 7.64 million shares of Alltel valued at about $270 million.

—*Elizabeth Lindholm*

IS Revenue $370.0 Million
NORTH AMERICA
71

3COM CORP.
5400 Bayfront Plaza
Santa Clara, CA 95052
(408)-764-5000

A scaled down 3Com Corp. emerged in 1991, fresh from its decision in January to concentrate on network adapters, hubs and bridges. In the process, it rid itself of work-group-related businesses, including the LAN Manager operating system. The move proved very costly: 3Com took a one-time restructuring charge of $67 million and, with fewer product lines, saw a drop in revenues.

As a result, 3Com's 1991 annual numbers were not pretty. Total revenues for calendar 1991 were down 15% to $370 million. The company lost $33 million, compared with a net gain of $24 million the year before. 3Com also reduced its work force by approximately 14%, ending up with 1,676 workers at year's end.

Clearly, 3Com felt it had no choice but to transform itself from a company focused on client/server computing to one competing in the global data-networking business, moving away from connecting desktops and toward connecting local area networks.

The old 3Com was a hodgepodge of businesses, all competing for precious development dollars; company executives claimed that it was consequently hard for salespeople to stay up to speed on all the product lines.

That previous product diversity was clearly shown just in the businesses from which 3Com exited in 1991. All development and marketing of LAN Manager were turned over to Microsoft Corp. Additionally, Communications Solutions Inc., which makes connectivity products for IBM's System Network Architecture (SNA), was sold to Attachmate Corp. And, unable to find a good buyer, 3Com wound down its work-group systems businesses, which included LAN servers, workstations and related software.

The change has left a very different 3Com. Work-group-related systems had contributed $113 million, or almost a quarter, of 3Com's revenues in 1990. That figure dropped to roughly 11% in 1991 and should drop to almost nothing in 1992. 3Com is hoping to pick up the slack primarily with its Network adapter division. In the second half of 1991, that division contributed 72% of sales.

To boost the adapter business even further, 3Com announced in January 1992 that it would acquire the data-networking products of U.K.-based BICC PLC, which 3Com describes as Europe's largest hub manufacturer. The deal cost 3Com $25 million in cash and a warrant for 500,000 shares of 3Com stock. As a result, 3Com took a $10.4 million charge in the quarter that ended February 29, 1992, but expects revenues to grow significantly this year as a result.

3Com continued to invest quite heavily in research and development (approximately 12% of total revenue) and has the products to show for it. In September, it announced two major reduced instruction set computing products: the LinkBuilder 3GH hub and a new bridge/router, the NETBuilder II. Both demonstrate 3Com's focus on providing multiple protocols and on supporting various bandwidths within single, scalable platforms. For example, the LinkBuilder 3GH delivers both Ethernet and Fiber Distributed Data Interface (FDDI) to the desktop.

"We continue to see evidence that our global data-networking strategies are working," says Eric Benhamou, 3Com's president and chief executive officer, pointing to the new product introductions and sequential quarterly sales improvements. Additionally, the company has started shipping products through a newly formed Japanese joint venture and began construction in Ireland of its first European manufacturing facility.

3Com may be on the right track, but whether these moves will be enough to recoup lost momentum is still a big question.—*Susan Kerr*

IS Revenue $355.0 Million
NORTH AMERICA
72

DIEBOLD INC.
818 Mulberry Road
Canton, OH 44707
(216)-489-4000

Last year may have been a tough year for IBM, but the computer giant's influence was still great enough to help Diebold Inc. achieve its best year ever. In September 1990, Diebold and IBM combined their automated teller machine operations into a joint venture, InterBold. One of four Diebold business units, InterBold, exploited IBM's overseas marketing might to help drive Diebold's foreign revenue up 21% in 1991.

In a tough year for the banking industry, Diebold's overall revenue grew 6.3% in 1991 to $506.2 million. Product sales accounted for 55% of the total revenue\and service income for 45%. Net income, meanwhile, rose a substantial 31.7% to $35.7 million. DATAMATION estimates Diebold's IS revenues at $355 million, up 8.1% from 1990's level.

InterBold unveiled a new line of modular ATMs in October and expects the so-called *i* Series to drive sales this year and beyond. Offering a 99% availability guarantee, the *i* Series ATMs come in various configurations and allow users to add modular upgrades rather than replace an entire ATM. Available modules provide features such as a multimedia dispenser that can handle airline tickets, postage stamps and other items, and "image-lift" technology that scans and displays the images of deposited checks.

The new ATMs can also accept an advanced terminal processor (ATP) module, which incorporates an Intel 80386SX microprocessor and runs the OS/2 operating system. Among other benefits, the ATP module supports InterBold's Software Extended Application, which lets financial institutions easily customize their ATM software and upgrade the units' functions. ATMs can also be connected into the same local area networks that support bank branch workstations and electronic security systems.

Aside from the InterBold ATM operation, other Diebold business units include the Diebold Security Products group, which offers electronic monitoring, access control and alarm systems, as well as physical security products, such as vaults. The North American Sales and Service unit maintains Diebold and other company products at more than 400 customer locations. And the Diebold International Sales and Service unit—just established in December—is working with IBM's World Trade Organization and with foreign distributors to accelerate the company's growth overseas. Diebold plans to increase international revenue to 40% of its total by 1996, up from the record 22% achieved last year.—*Dwight B. Davis*

IS Revenue 73 **$353.0 Million**

NORTH AMERICA

CADENCE DESIGN SYSTEMS INC.

555 River Oaks Parkway
San Jose, CA 95134
(408)-943-1234

When you think Cadence Design Systems Inc., think mergers and acquisitions. The manufacturer of computer-aided design and engineering (CAD/CAE) software for the electronics design industry is itself the result of a 1988 merger between SDA Systems Inc. and ECAD Inc. Four years and four mergers later, the company has built itself into the leading seller of electronic design automation (EDA) software, according to market researcher Dataquest Inc. of San Jose.

Although M&A fever has made Cadence a hot EDA vendor, it hasn't made the company's financial figures any healthier. The spending spree, highlighted by Cadence's $200 million merger with Valid Logic Systems Inc. in December, is causing the company to come up short in the profit column. After raking in a $6 million profit in 1990, last year's net earnings disappeared in a $22 million sea of red ink, while total revenue inched up only 0.5% to $392 million. IS revenue growth outstripped the paltry 0.5% gain in total revenue, rising 9.6% to $353 million.

While Cadence points to the strength of its finances overall, and to its impressive market share, the soft economy has taken a toll on the company's business. Sales for the first half of the year dipped, as Cadence's normally robust customer base of manufacturers hesitated on purchasing decisions. As a result, the company's revenue dropped nearly 15% in the first quarter. But, fueled by a slight uptick in the economy and news of the Valid merger, sales rallied in the fourth quarter.

Following the merger, former Valid president and chief operating officer L. George Klaus was appointed executive vice president and COO of Cadence. The company is also merging the Valid and Cadence product lines, a process that will continue throughout this year.

The merger gives Cadence a commanding 24% market share in electronic design automation software, according to Dataquest—twice as much as its nearest competitor, Mentor Graphics Corp. It also means layoffs. Cadence cut about 10% of its work force, beginning in January, due to redundant positions resulting from the merger.

But misery loves company. Competitor Mentor Graphics reported a whopping $61.6 million loss for 1991, citing the same weak economy and slumping EDA sales.

On the brighter side, in October Cadence announced a multiyear, multimillion dollar pact with Fujitsu Microelectronics Inc. to build a new integrated circuit design system. The following month, the company introduced version 4.0 of its Dracula IC verification software and the InQuery graphical debugging software.
—*Mike Ricciuti*

IS Revenue 74 **$350.9 Million**

NORTH AMERICA

MICROPOLIS CORP.

21211 Nordhoff Street
Chatsworth, CA 91311
(818)-709-3300

As it celebrated its 15th birthday in 1991, Micropolis Corp. found out that security does not necessarily accompany maturity. Revenue for the disk drive manufacturer decreased 7.9% to $350.9 million in 1991, after swelling 24.1% the previous year. Net earnings were nearly cut in half, diving 46.3% to $4.3 million.

Yet despite a difficult year, which included a $3.8 million loss in the third quarter, Micropolis remained cautiously optimistic. The reason was a slew of new products introduced in 1991 and greater emphasis on the distributor and reseller channels versus the tough original equipment manufacturer (OEM) computer supplier market.

Because new-product shipments had yet to take hold by year's end, Micropolis was unable to make up for revenues lost by aging products. In October, Micropolis announced a 2.4-gigabyte, 5.25-inch drive, which it claims is the highest capacity drive of its size in the market. The product is designed to replace systems that now use 8-inch drives, a disappearing market. In fact, Micropolis claims the yearly revenue decline resulted primarily from 60 to 70% drops in sales of its mature 85, 170 and 380MB full-height drive products and from declining demand for its 180MB half-height 5.25-inch drives.

Of all of Micropolis's new 1991 products, the one with the most hope attached to it was the 1.05-gigabyte 3.5-inch drive, the model 2112. First-evaluation units shipped in the fourth quarter, but Micropolis didn't ship in volume until the second quarter of 1992. Called the highest-capacity 3.5-inch drive by the company, the model 2112 is Micropolis's first entry into the large workstation market.

Other significant products include the RAIDION redundant array of inexpensive disks (RAID) product line, introduced in September. It's the first level-5 RAID certified for use with Novell NetWare software, and with it Micropolis hopes to take advantage of the increased demand for high-transaction, fault-tolerant data storage in the network file server market.

Even with new products, tough times are still ahead for Micropolis. Its traditional OEM base of computer systems manufacturers is contending with its customers' continued moves toward downsizing, and the recession has lasted longer than anticipated. While a recovery may be in the offing, Micropolis president and chairman Stuart P. Mabon warns Micropolis watchers to not to get overly excited. "The demands of what is essentially a high-technology commodity business will keep the pressure on disk drive manufacturers," he says.

—Susan Kerr

IS Revenue **$342.0 Million**

75

NORTH AMERICA

POLICY MANAGEMENT SYSTEMS CORP.
Intersection of I 77 and U.S. 21 North
Blythewood, SC 29016
(803)-735-4000

G. Larry Wilson is one president and chief executive who can say his company completely accomplished its strategic and financial goals in 1991. And he has the numbers to prove it. His firm, Policy Management Systems Corp., which provides software and services to the insurance industry, especially benefited from an explosion of new contracts for outsourcing.

PMSC reported corporate revenue of $415.3 million in 1991, hitting its 20% annual growth target dead on. Net earnings rose 28% to $47.5 million. IS revenue grew 25.7% to $342 million. Healthy expenditures on research and development—a strategy partially responsible for the firm's success, analysts say—totaled $68 million in 1991, or about 16% of revenue.

The company has been moving steadily from its base as a supplier of software solutions for small- to medium-sized North American property and casualty insurance companies to a provider of all types of insurance applications for all size companies worldwide.

IBM's equity investment in PMSC two years ago—now at 16.5%—gave the company the credibility it needed to sell its Series III product family to some of the biggest insurers in the industry, say analysts. Last year, pressures within the insurance industry helped make those companies buyers of PMSC's outsourcing services, as well as its software products.

PMSC met strategic goals on a number of fronts in 1991, Wilson says. The firm issued release 3.0 of Series III. The new release included enhancements to its property and casualty applications and its life and health insurance applications. In addition, new life and health products were key to PMSC's strategy to broaden its base in insurance.

With the new release, Series III is about one-fifth the way to its ultimate goal, says Wilson. The new Series III products are heavily oriented toward cooperative processing, a computing environment that insurers are being forced to adopt for competitive and economic reasons, Wilson asserts.

While PMSC is a full-blown services firm, all of its services are based on its own software products. That's why its heavy R&D investments are crucial, say analysts. "The insurance industry is very complicated. Getting business expertise in insurance is very expensive," says an analyst who requested anonymity. "No one else is as well positioned as PMSC."

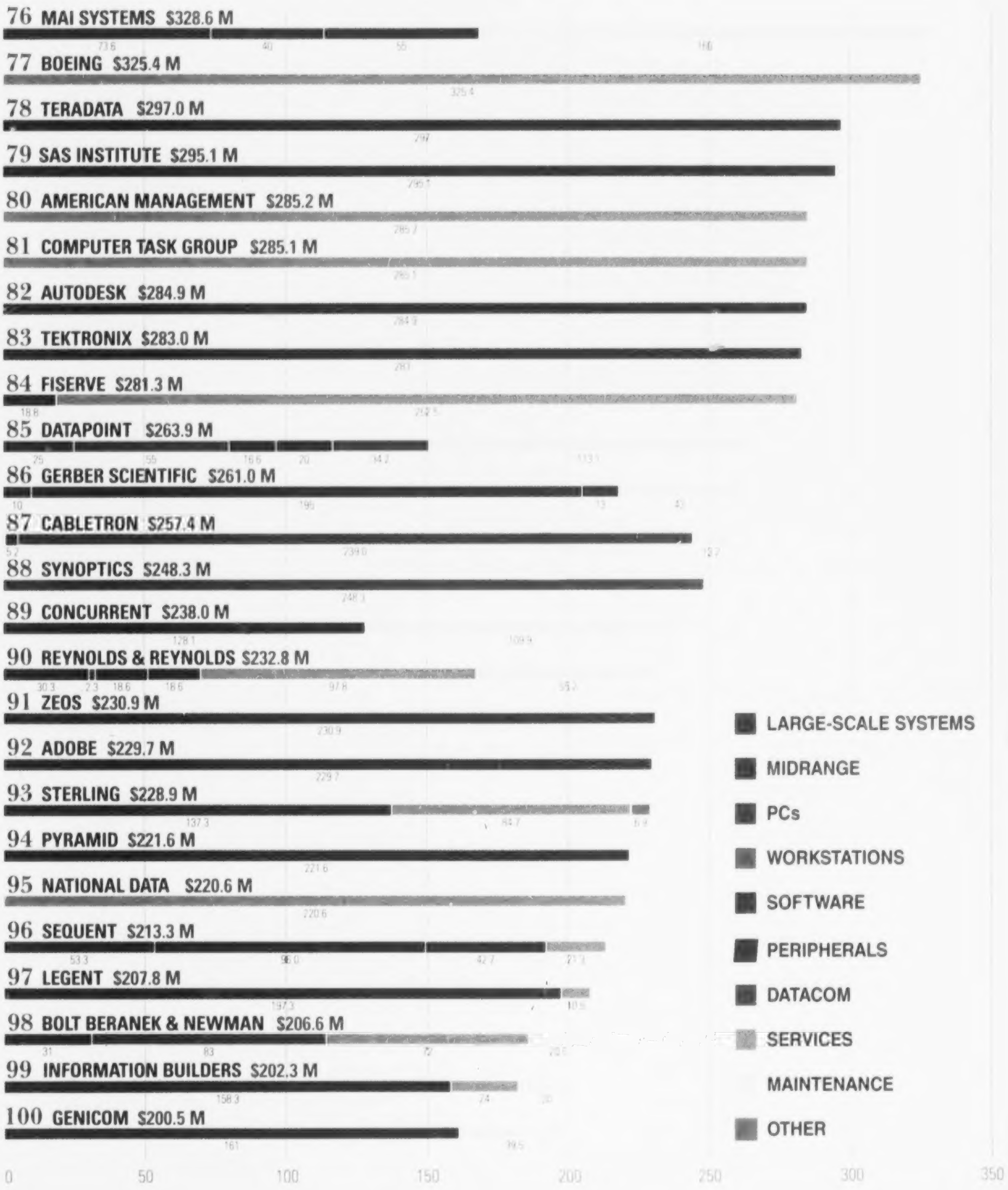
Another key strategy in 1991 was to move aggressively into overseas markets. PMSC and IBM jointly opened a solution support center in Cologne, Germany, and PMSC also operates large data centers in Australia and the United Kingdom. PMSC signed outsourcing agreements with three big European insurers and one Australian insurer in 1991 and expects snowballing growth in its overseas business this year.

Wilson projects such overseas growth because, he says, European insurers are under general economic pressures to become more global and are under pressure from the European Community to become pan-European.

Wilson's future challenge will be to maintain the firm's growth across all fronts, however. Development for the company's next release of Series III, scheduled for the first quarter of 1993, is well under way. PMSC expects to move further into the health field with more managed care products and will continue to expand in the life insurance market. Wilson predicts some acquisitions within the next yearto move these goals ahead faster.

Analysts don't foresee any problems in PMSC's ties to IBM. Despite IBM's mainframe foundations, PMSC is proactively moving its customer base away from mainframes into cooperative-processing environments. "IBM helped PMSC get its foot inside some doors, but PMSC has a very balanced approach—the company and the customer come first, and then its relationship with IBM," comments the analyst.

—Leila Davis



NORTH AMERICAN COMPANIES

IS Revenue **76** $328.6 Million
NORTH AMERICA

MAI SYSTEMS CORP.
2642 Michelle Drive
Tustin, CA 92680
(714)-731-5100

MAI Systems Corp. thrived for nearly 20 years by building minicomputer systems and software that small and medium-sized companies use to run their businesses. Four years ago, when competition from high-end PCs and from more established minicomputer companies began to nibble at the market MAI had targeted, it changed strategies.

First it tried to diversify, in a well-publicized but unsuccessful attempt to acquire Prime Computer Inc. Then it stopped making its own minicomputers to become a value-added reseller (VAR) of other systems. The idea was to add applications it had developed for a half-dozen years to newer systems. Nothing seemed to work.

In 1991, MAI reported a 14% decline in revenues to $328.6 million and a loss on those revenues of $59.8 million, which was, nevertheless, an improvement over 1990's $85 million in red ink. Analysts attributed MAI's poor showing to a reduced demand for midrange computer systems in Canada and the United States and to competitive pricing of current products. They also blamed the poor results on discounting of older MAI equipment. But the problems seemed to go much deeper, warranting still another change in strategy.

So MAI is taking yet another route: it's becoming a systems integrator with a little bit of value-added reselling along the way, according to its new marketing vice president, Sam Gagliano. And by this summer, it plans to drop many of its VAR agreements which, Gagliano says, have spread the company too thin. He says MAI, in consultation with systems integration clients, will decide which hardware platforms would meet the needs of specific applications.

At the heart of its new strategy is the company's existing customer base of 25,000 owners of old MAI computer systems. In 1991, half of its revenues came from serving and maintaining these systems. It has formed a business systems operation to provide enhancements to these customers. MAI has also formed an industry solutions group to offer new customers software applications in manufacturing, wholesale distribution, general accounting and health care.

The new strategy is in the hands of MAI's third president in three years, Peter Andersen, who last year joined the company from Western Union Corp. He replaced eight of the company's 10 line managers and slashed the payroll more than a third, down 1,200 to 2,300.

Early this year, there were signs the new approach could be paying off. In the last quarter of 1991, losses totaled only $2 million, after two successive quarterly losses of $26 million. It was the smallest loss in six quarters. Stay tuned.—*Tom McCusker*

IS Revenue **77** $325.4 Million
NORTH AMERICA

THE BOEING CO.
7755 East Marginal Way South
Seattle, WA 98108
(206)-655-1131

As in past years, more than 80% of Boeing Computer Services's revenue in 1991 came from providing computing and telecommunications services to its parent, The Boeing Co. That internal business, in turn, was buoyed when the aircraft manufacturer ramped up production of its new 777 wide-body twinjet. The demands of that program helped boost BCS's 1991 revenue up 15.7% to $1.92 billion.

Ironically, the computer group's 777 windfall ate into corporate Boeing's profits. To support the 777 program, Boeing's research and development budget grew 71.7% to $1.42 billion in 1991. Even with the added R&D expense, though, corporatewide net earnings grew 13.1% in 1991 to $1.57 billion, and revenues grew 6.2% to $29.31 billion.

For Boeing Computer Services, the large increase in the internal demand for its work wasn't matched by its external business arm: external business accounted for $325.4 million of the 1991 total revenue, up just 1.7%. Federal government contracts accounted for fully $247 million of that external revenue, reflecting BCS's decision during the 1990-1991 period to exit the commercial marketplace. The company still accepts commercial work, but doesn't actively pursue it, according to Stan Beckelman, vice president of information services at BCS.

"The federal government seems to offer enough opportunities to keep us occupied," he says. Those opportunities come from civil agencies—especially the National Aeronautics and Space Administration (NASA)—as well as from the Department of Defense.

The highlight of 1991 for BCS was when it won a $1.6 billion contract from the U.S. Army Information Systems Selection and Acquisition Agency. Under the 12-year contract, Boeing and its subcontractors will implement the Reserve Component Automation System (RCAS). The goal of RCAS is to reduce the time soldiers spend on administrative tasks, thereby allowing more time for readiness preparation and training.

BCS won the contract last October, following a year-long competition with Computer Sciences Corp. CSC contested the award, but the courts gave the go-ahead to Boeing at the very end of the year. Thanks to the RCAS revenue flow, Beckelman expects this year's external business to show more substantial gains than it did last year. The internal arm, meanwhile, may slow some as production of the 737 jet is cut back.

With the RCAS business, the number of external staff members will grow more than 14%, from about 2,800 employees to about 3,200 by year's end, Beckelman estimates. Given the amount of federal work available, BCS could grow even faster, he says, if it could find enough qualified personnel. "Staff capabilities are a significant resource for us, and the people we need are in short supply," he says. If BCS expands too fast without the necessary staff experience, Beckelman says, the company's high success rate in competing for contracts would probably suffer, which, in turn, would raise the cost of landing new business. *—Dwight B. Davis*

IS Revenue **$297.0 Million**

78

NORTH AMERICA

TERADATA CORP.

100 North Sepulveda Boulevard
El Segundo, CA 90245
(310)-524-5000

Teradata Corp. introduced its first database management computer system in 1984 and never looked back. The start-up went on to five years of 100%+ compound annual growth and was lauded in the press as America's fastest growing company. Last year, revenue climbed 25.3% to $297 million for 1991, topping the previous year's 24.9% jump. Teradata's net earnings reached $9.1 million.

In early 1990, Teradata had formed a close technology partnership with NCR Corp., but last year found itself weighing the option of an escape clause, following AT&T's acquisition of NCR. Instead of escaping, Teradata was embraced: in December, the company agreed to merge with NCR for an AT&T stock swap, a move Teradata's shareholders approved this February.

Teradata's name will live on, but only on the side of the massively parallel DBC/1012 database management machines, which the company created and which NCR will continue to sell and support. Teradata's development and manufacturing operations have been folded into the NCR Large Computer Products division, while its domestic marketing operations have been used to help create the Large Computer Systems division within NCR's United States Marketing Group. International Teradata marketing groups have been merged into NCR's local marketing organizations. Most of Teradata's 1,600 employees have been retained, although about 175 administrative staff were let go.

Among those leaving was Kenneth W. Simonds, who had been Teradata's chairman and chief executive officer. "Following AT&T's acquisition of NCR, it made a lot of sense for us to get together with them," he now says. "Our parallel-processing technology has the potential to make a major contribution to future computing architectures, but we needed the horsepower of a company like AT&T to achieve that goal."

NCR was already a believer in the DBC/1012's design, which bundles together anywhere from a few to several hundred standard microprocessors and employs an intelligent interconnection network to manage database entries and queries. NCR licensed some of Teradata's technology for use in the NCR 3600, a general-purpose parallel mainframe computer. The AT&T subsidiary had also established a joint development organization with Teradata to pursue further parallel-processing innovations; that work continues within the newly named NCR Torrey Pines Development Center.

Customers who want only a dedicated database machine can still buy the Teradata processors from NCR, but the corporate emphasis is to move users to more general-purpose parallel architectures. Embodied as the NCR 3600 and the future NCR 3700, these parallel machines will not only support database management operations but also UNIX-based transaction-processing applications.

—Dwight B. Davis

IS Revenue **$295.1 Million**

79

NORTH AMERICA

SAS INSTITUTE INC.

SAS Campus Drive
Cary, NC 27513
(919)-677-8000

Although many still consider SAS Institute Inc. to be a vendor of statistical packages, the company is quietly becoming a major force in commercial IS.

A growing number of users have made the SAS System For Information Delivery their primary software system, replacing or augmenting systems from such traditional IS heavyweights as Computer Associates International Inc., Oracle Corp. and even IBM. The SAS System, which comprises SAS's collection of modules and database tools for data access, management, analysis and presentation, found a new home at 2,600 new user sites in 1991, to bring the worldwide total to just over 23,000.

SAS's revenue jumped 22.9% in 1991, to $295.1 million. According to SAS president Jim Goodnight, PC software was a big gainer in the product line; revenue for SAS Software under DOS and OS/2 was up 25%. VMS and ULTRIX climbed 20%, and revenue from mainframe software, while dead last, still managed to climb 18% over 1990's levels.

In 1991, the company introduced the SAS System for seven UNIX variations including Digital Equipment Corp.'s RISC/ULTRIX, IBM's AIX, Next Computer Inc.'s NeXTstep and

Silicon Graphics Inc.'s IRIX.

Another factor driving sales, says Goodnight, is that when SAS System users need to install a new application, many purchase SAS modules, like SAS/Graph for data graphing or SAS/Calc, a spreadsheet module, instead of buying stand-alone applications from other software vendors. That's a situation SAS wants to cash in on this year—selling users packages that run on the base SAS System to perform specific tasks, such as SAS/EIS, an executive information system that the company introduced earlier this year.

Other highlights from 1991 include the August shipment of an updated SAS/C compiler and the September announcement that SAS will be a partner in the IBM Information Warehouse, Big Blue's framework for corporate data access. Earlier this year, SAS began shipping its next-generation version of its system, release 6.07. *—Mike Ricciuti*

IS Revenue **80** **$285.2 Million**

NORTH AMERICA

AMERICAN MANAGEMENT SYSTEMS INC.

1777 North Kent Street
Arlington, VA 22209
(703)-841-6000

Despite a slowdown in some of its key markets, systems integrator American Management Systems Inc. grew 1991 revenues 8.9% to $285.2 million. Net earnings were up 11.5% to $11.6 million.

AMS sells consulting services and software products to manufacturing, financial, government and telecommunications companies. The 22-year-old company's bread-and-butter business, systems integration for telecommunications and financial services firms, essentially dried up in 1991.

Company chairman Charles O. Rossotti says those parts of AMS's business felt the effects of a general economic slowdown during 1991, leaving government-consulting contracts and new product development to pick up the slack.

Imaging is one area into which AMS is venturing. In 1991, the company began selling the Image and Record Management (IRM) system, codeveloped with IBM (which holds a 10% equity stake in AMS).

In 1991, AMS also struck a deal with NYNEX Mobile Communications to develop a customer management and billing system for the cellular telephone industry. And earlier this year, the company said it would develop custom applications for Grid Systems Corp.'s wearable pen computer, the PalmPAD.

AMS is currently working on PalmPAD applications for the U.S. Navy. Those applications will be used for taking inventory of hazardous material and for keeping track of ship maintenance. The company has also built pilot PalmPAD applications for utility data collection and bedside hospital care.

The company also stepped up its international expansion. In 1991, its international business increased by 43% over 1990's level and now accounts for more than 10% of AMS's total services and products revenue.

—Mike Ricciuti

IS Revenue **81** **$285.1 Million**

NORTH AMERICA

COMPUTER TASK GROUP INC.

800 Delaware Avenue
Buffalo, NY 14209
(716)-882-8000

You'd think Computer Task Group Inc., which earns its keep by helping those big, big, really big *Fortune* 100 firms make their information systems work faster, better, smarter or cheaper, made out like a bandit last year. After all, the company saw revenue rise by 16.9% to a tad over $285 million. But net earnings plummeted 87.7% to a mere $890,000 due to the cost of acquisitions and increases in tax provisions.

Of course, the big jump in revenue didn't just happen by itself. CTG set out in 1990 to increase its communications services capabilities, for example, when it announced plans to acquire systems integrator Connolly Data Systems Inc. and Telecommunications Management Consultants, and boosted its international-consulting practice with the purchase of Rendeck International N.V., an IS professional services firm based in Amsterdam, The Netherlands.

Last year, CTG concluded those deals and then set about remaking itself to better respond to a tsunami of customers clamoring for help implementing advanced technologies.

The result, says Stephen Hoffman, CTG's senior vice president for marketing and sales, is a corporate restructuring that has divided the company into eight new ready-for-anything business practice groups.

The business practice approach represents a new strategy for CTG, says Hoffman. In the past, CTG has been a branch-based organization structured around its 65 worldwide offices. The new structure will be based on technology practices, which will provide support to the branch offices.

"We've always had specialty businesses and services, but by introducing new business practices divisions we will be able to employ certain valuable skills that already exist in the firm and focus them more fully on behalf of clients' specific needs," says Hoffman.

The eight new technology-based practice divisions comprise:

1. CTG's new Communications Systems practice, which subsumes both CTG's own communications services business unit, as well as the newly acquired Connolly Data Systems (renamed the Network Systems Integration unit) and

Telecommunications Management;

2. The all-new Information Engineering practice, which will emphasize the use of a standard computer-aided software engineering development methodology across all branches of the company;

3. The Information Media practice, CTG's attempt to bring multimedia capabilities to its consulting, training and integration services;

4. The Migration Services practice, aimed at helping clients move applications, databases and hardware to new operating systems, platforms and development environments;

5. The Database Consulting practice;

6. The Industrial Systems Integration practice;

7. The Image Systems practice, intended to help clients install and use imaging systems to manage workflow;

8. The Project Management practice.

What's driving CTG's restructuring into business practices? "We want practitioners to introduce advanced technologies to the highest possible degree within the firm and make those technologies directly available to our customers," says Hoffman.

—J. William Semich

IS Revenue
82
$284.9 Million
NORTH AMERICA

AUTODESK INC.
2320 Marinship Way
Sausalito, CA 94965
(415)-332-2344

As its revenue growth rate continued to slow in 1991, PC-based computer-aided design software market leader Autodesk Inc. began to make a concerted push into new markets.

The company continued to enhance its workhorse AutoCAD product, adding a new release—number 11—and a Windows version. Autodesk also, however, announced multimedia and molecular-modeling software packages and laid plans to enter the information services business.

"In the past, our strategy has been to provide production CAD tools to the mass market and specifically to give 80% of the function of high-end systems for 20% of the price," says Autodesk vice president for European operations Volker Kleinn. While Autodesk continues to pursue those goals, "we want to expand away from the perception of being a one-product company," Kleinn elaborates. "We want to move into other technologies that provide benefits to our existing customers and that help widen our markets."

Accordingly, non-AutoCAD revenue in 1992 will amount to 13 or 14% of Autodesk's total, says Kleinn.

In 1991, however, 91% of Autodesk's revenues continued to come from AutoCAD, which most analysts say still commands between 65 and 70% of the PC-based computer-aided design market. Thanks to the effects of the recession—particularly on architectural and building markets—and to slowdowns in some international markets, Autodesk saw revenue growth dip to 19.8% in 1991 compared with the 33% growth rate the company enjoyed in 1990. Its $284.9 million in 1991 revenue produced earnings of $57.8 million, up 1.8%.

To lead Autodesk into new markets and perhaps faster growth, the company's board of directors in early 1992 hired former Sun Microsystems Inc. field operations vice president Carol Bartz as Autodesk's new president, chief executive officer and chairman. Bartz replaced Alvar J. Green, who retired from Autodesk in October.

Autodesk's 1991 move into new markets saw the company introduce and ship the PC-based HyperChem Molecular Modeler. The product was actually developed by independent software vendor HyperCube Inc., in which Autodesk purchased a 22% interest in 1989.

In multimedia, Autodesk intensified its efforts by enhancing its Animator products. Autodesk added an upgraded version called Animator Pro and a 3-D-modeling, -rendering and -framing product called 3D Studio.

And late in 1991 Autodesk began rolling out American Information Exchange, a new information value-added network product. Autodesk expects independent information vendors such as newsletter publishers and even small software vendors to use American Information Exchange to distribute their products to PC users.

Autodesk has its eye on other new product areas, as well. Kleinn says the company has plans to build new products for both the front and the back end of the design/manufacturing process. "AutoCAD is currently used mainly in production drafting. We plan to provide tools for other areas, such as conceptual design and even for integrating design documents into the manufacturing process," says Kleinn. Autodesk cofounder and programmer John Walker is currently working on melding AutoCAD with computer-integrated manufacturing (CIM) products at the company's European Software Center in Neuchâtel, Switzerland.

Autodesk expects something of a rebound in 1992. With the help of several new products due to ship this year—including release 12 of AutoCAD—and a rally in the world economy, Kleinn says, Autodesk expects to report a 28% increase in revenues in 1992.*—Jeff Moad*

IS Revenue
83
$283.0 Million
NORTH AMERICA

TEKTRONIX INC.
27400 South West Parkway
Wilsonville, OR 97070
(503)-627-7111

What was to have been a turnaround period for Tektronix Inc. became yet another frustrating year in 1991. The maker of test and measurement systems, TV studio equipment, and computer printers and terminals managed to turn a $70 million loss in 1990 into a $44.9 million profit in 1991. But revenues slipped 6.4% to $1.31 billion for the company as a whole, and DATAMATION estimates that IS revenues ended the year down 2.9% to $283 million.

Hurting this year's performance was a $17.3 million restructuring charge incurred last winter for severance costs and asset write-downs. Tektronix's employee count had fallen to 11,464 at the end of the third quarter, down from 12,001 a year earlier.

Within this bleak economic tableau, a new color printer managed to raise spirits at the pioneering electronics company. Introduced last summer, the $10,000 Phaser III printer was the first to use a solid ink technology, making it able to produce brilliant colors on plain paper and other media. Demand for the Phaser III has exceeded the company's expectations—and driven a 50% growth rate within Tektronix's printer business.

Buoyed by Phaser III sales, printer revenue (which includes thermal color printers as well) should reach $185 million in fiscal 1992, or about 14% of overall corporate revenue, estimates Richard S. Chu, a Cowen & Co. analyst in Boston. By spring of 1993, printer revenue should hit $225 million, he predicts.

Another graphics product area—X terminals—hasn't come through for Tektronix as well. Although X terminal shipments are growing "at a hefty clip," revenue from their sales is not yet high enough to replace the declining income from sales of the company's older graphics terminals, says William R. Spivey, vice president of the Computer Graphics Group.

Further down the road, Tektronix expects to bring to market flat-panel display products based on liquid crystal technology developed within its highly regarded in-house labs. In addition, by this time next year, analyst Chu predicts, Tektronix will probably have shoehorned the solid-ink Phaser III technology into printers costing $6,000 or less. Even so, it won't be easy for the company to hold onto its advantage in this sector of the color printer business, Spivey acknowledges. —*Dwight B. Davis*

IS Revenue **$281.3 Million**

84 NORTH AMERICA

FISERV INC.
2152 South 114th Street
West Allis, WI 53227
(414)-546-5000

Data-processing services firm Fiserv Inc. bought its way onto the North American DATAMATION 100 when it "swallowed the whale," as one analyst put it, and acquired Citicorp Information Resources Inc. The purchase supplemented its steady 20% internal growth, boosting revenues 53.7% to $281.3 million. At the same time, net earnings for the company, which concentrates on the financial-services industry, jumped 29% to $18.3 million.

Swallowing CIR, Citicorp's own data services company, was accomplished with apparently little indigestion despite its size, since virtually all of the CIR management was retained. In addition, Fiserv's management team visited hundreds of CIR clients to reassure and retain them. What's more, Fiserv remained hungry enough to gobble up another service bureau, BMS Processing Inc., now Fiserv Boston, and the data-processing operations of two banks—the Federal Home Loan Banks of Chicago and Dallas—before the year's end.

Economic woes in the financial services industry, combined with the high cost of staying technologically competitive, have made financial institutions ripe for Fiserv's data-processing services and outsourcing. The company also has a number of government contracts to maintain the DP operations of failed savings and loans held by the federal Resolution Trust Corp.

All 1991 acquisitions were financed out of cash flow from operations and from the proceeds of a public stock offering of 1.3 million shares of common stock, which netted $47 million.

Even the addition of CIR-developed software systems is going smoothly, say both analysts and Fiserv president and chief operating officer Leslie Muma. Fiserv had not marketed software packages before the CIR acquisition. Muma expects CIR's International Comprehensive Banking System software and its International Financial Institutions Consulting business to expand Fiserv's modest overseas business.

Earlier this year, Fiserv acquired a maker of plastic credit and debit cards to round out its automated teller machine (ATM) offerings. Muma predicts further acquisitions in 1992, concentrating specifically on growing Fiserv's core business as a service bureau and on two closely related areas: item processing and ATM services. "We are very focused in what we do," says Muma.

Despite the constant acquisition activity, analysts say Fiserv is moving slowly and appropriately in its growth. Growth of internal operations is keeping pace: 158 new clients—over 100 requiring full services—were added in 1991 apart from the acquisitions. Separate from the CIR purchase, Fiserv picked up a contract to do Citicorp's corporate payroll for three years at $20 million per year.

Fiserv's biggest challenge, according to analysts, will be to continue growing as the number of financial institutions shrinks. Broadening its service bureau business to include item processing and additional ATM systems is expected to help future growth. Muma also predicts that the company will move into image processing for financial institutions in the near future. —*Leila Davis*

IS Revenue $263.9 Million

85

NORTH AMERICA

DATAPOINT CORP.

8400 Datapoint Drive
San Antonio, TX 78229
(512)-593-7000

Datapoint Corp.'s fortunes brightened in 1991. Despite a slight 0.6% dip in revenue to $263.9 million, the company reported net earnings of $346 thousand—its first annual profit in several years. That compares with a loss of $66.7 million on revenues of $265.6 million in 1990.

A major product announcement this year could bode well for the future, as well. Datapoint finally rolled out ARCnet Plus in January 1992. ARCnet Plus is the enhanced version of ARCnet, Datapoint's flagship product and one of the earliest local area network architectures.

ARCnet Plus, as might be expected, adds new features and functions, the most important of which is speed. ARCnet operates at a data rate of 2.5 megabits per second, far too slow for many applications, such as graphical user interfaces and database management systems. ARCnet Plus offers a speed of 20Mbps, slightly faster than 16Mbps Token Ring, but slower than 100Mbps FDDI.

However, Datapoint will be facing some tough sledding in the LAN architecture market. In the interim between ARCnet versions, Ethernet, Fiber Distributed Data Interface (FDDI) and Token Ring have eclipsed the older network architecture, becoming de facto standards in the fast-growing LAN market.

Nevertheless, ARCnet still has a cadre of users, particularly overseas. The company continues to close some big sales, primarily in Europe, which accounts for 84% of the company's revenue. And, despite its problems, ARCnet has retained about 11% of the U.S. LAN market, according to Santa Clara-based InfoCorp.

What's more, Datapoint has been taking steps to counter its problems. In 1987, the company formed the ARCnet Trade Association, which is petitioning the American National Standards Institute (ANSI) for approval of ARCnet as an official standard. That approval could occur later this year and open doors for ARCnet sales in the government market.

—Bob Francis

IS Revenue $261.0 Million

86

NORTH AMERICA

GERBER SCIENTIFIC INC.

83 Gerber Road West
South Windsor, CT 06074
(203)-644-1551

Tough times are especially tough on a company like Gerber Scientific Inc., whose computer-aided design and manufacturing (CAD/CAM) systems serve on the front lines in several factory automation niches. When the factories cut production, Gerber is quick to suffer.

The company's revenue totaled just $261 million, down almost 7% from the previous year. Net earnings dived 77% to $7.4 million.

Gerber's main line of defense is to keep research and development spending high and to keep new products in the pipelines at its five subsidiary branches. In 1991, R&D spending actually rose 5.1%, and the company introduced several key new products.

These products include the Crescent Laser Photoplotter from the Gerber Scientific Instrument Co. The photoplotter—which generates films for the manufacture of printed circuit boards—is the company's first such system under $100,000. Gerber Garment Technology Inc., meanwhile, added the AccuPlot 700-VHD-CSX plotter/pattern cutter to its extensive line of products aimed at the apparel industry. The other three subsidiaries—Gerber Scientific Products Inc., Gerber Optical Inc. and Gerber Systems Technology Inc.—are also attempting to stimulate sales with a barrage of new products for their target markets.

Gerber also has been busy on the legal front, pressing a patent infringement case against France's Lectra Systemes SA. Last winter, a U.S. court-appointed Special Master recommended that Lectra pay Gerber $4.7 million, plus interest, for infringing upon certain patents dealing with automated fabric-cutting equipment. At press time, the recommendations were under consideration by the U.S. District Court in Northern Georgia. The company, which holds close to 1,000 patents, is pursuing several other lawsuits both domestically and in Europe.

Despite the hard times, Gerber holds one major advantage over its competitors, which are generally much smaller companies, says Peter Russo, treasurer and corporate controller. The company generates a lot of cash, and had $40 million to $50 million on its balance sheet this spring. "As a result, we can be very price competitive," Russo says. Gerber has also loaned money to some of its customers, who then use it to buy Gerber equipment, effectively setting up a leasing arrangement, he explains.

—Dwight B. Davis

IS Revenue $257.4 Million

87

NORTH AMERICA

CABLETRON SYSTEMS INC.

35 Industrial Way
Rochester, NH 03867
(603)-332-9400

When George Bush went looking for New England's economic vital signs during February's New Hampshire primary campaign, he paid a visit to Cabletron Systems Inc. It was a shrewd choice for a photo opportunity. This enterprising New Hampshire-based manufacturer of intelligent hubs, integrated network management software and other networking products has been one of the brightest points of light to be found in the U.S. economy during the last four years.

Entrepreneurs extraordinaire, Cabletron's chairman and chief operating officer Craig R. Benson and president and chief executive officer Robert Levine have parlayed their little cabling supply business—founded in Levine's garage in 1983—into the niche-market darling of Wall Street.

Cited by *The Wall Street Journal* as the company with the best-performing stock on the New York exchange in 1990, Cabletron then went on to have its best year ever amid the bleak New England recession of 1991. IS Revenue for the year jumped 71.5% to $257.4 million, and net earnings climbed 69% to $52.4 million.

Building on its solid foundation of cabling services, transceivers, network interface cards and other physical-link level products for local area networks, Cabletron entered the intelligent hub market in 1988 with the introduction of its Multi Media Access Unit (MMAC), the industry's first modular smart hub.

MMAC, like rival SynOptics Communications Inc.'s LattisNet System 3000 and other intelligent hubs, permits the interchangeable use of disparate network media, including Ethernet, Token Ring and Fiber Distributed Data Interface (FDDI), running over any type of wiring, including low-cost unshielded twisted pair.

According to Chip Pettirossi, network industry analyst for International Data Corp. in Framingham, Mass., 1991 unit sales for MMAC closely rivaled those of SynOptics's market-leading LattisNet product and far outpaced low-cost offerings from Chipcom Corp. and David Systems Inc. "Our estimates indicate that Cabletron added approximately half a million nodes to its MMAC installed base in 1991," says Pettirossi. And the market is far from mature. "Only about 15% of the potential market for these products has been tapped," he says. "We can expect average growth for smart hub vendors to continue at 50 to 60% per year over the next four years."

But Cabletron is not your average smart hub vendor. In late 1990, the company burst out of the wiring closet with its expert systems-based Spectrum network management system. Spectrum, which is targeted at large enterprise networks, integrates various proprietary network management platforms and permits simultaneous management of multiple LAN topologies and protocols. For Cabletron, it is the capstone of an integrated network architecture and the basis for a systems integration strategy that has transformed this tiny company into a formidable large-account competitor for Digital Equipment Corp., Hewlett-Packard Co. and IBM.

As a consequence of Spectrum's success, Cabletron now faces the tough, yet enviable, management challenges that inevitably plague growth companies. Its roster of 2,300 employees represents an increase of 90% over 1990. As its installed base continues to expand and the complexity of its product offerings increases, efficiency could become difficult to sustain—without rubbing customers the wrong way.

Nevertheless, CEO Levine is optimistic. "As we've gotten larger, we've managed to maintain the same ratio of personnel devoted to technical support," he points out, adding that repeat business from satisfied customers represents 68% of Cabletron's annual revenue—a striking percentage for a young company in a growth market. "We presently have 800 full-time employees devoted exclusively to service and technical support," boasts Levine. *—Don Marks*

IS Revenue 88 **$248.3 Million**

N O R T H · A M E R I C A

SYNOPTICS COMMUNICATIONS INC.

4401 Great America Parkway
Santa Clara, CA 95052
(408)-988-2400

While some smart-hub vendors can't see the network for the nodes, SynOptics Communications Inc.—best known for its high-end LattisNet System 3000 intelligent hub—has focused its energies on establishing partnerships with large distributors and value-added resellers who provide total network solutions.

This multichannel distribution strategy, coupled with key product development relationships, has helped this young and lean 1,000-employee spinoff of Xerox Corp.'s Palo Alto Research Center grow into a networking powerhouse.

Laying claim to an installed base of 2.3 million nodes, or 38% of this burgeoning network management market, SynOptics was for most of its seven years the dominant smart-hub vendor. But despite a solid performance in fiscal 1991, including 41.1% revenue growth to $248.3 million, the company fell short of many analysts' predictions. For the first time since its founding in 1985, SynOptics's annual revenue trailed behind that of principal smart-hub competitor Cabletron Systems Inc. Still, with respectable earnings of $26.8 million—which while down 5% from 1990's level, still represents 10.8% of revenue—and with revenue per employee at $248,000, the company's financial position remains extremely strong.

Although it faces a vigorous challenge from Cabletron, SynOptics recently has taken aggressive steps to regain its preeminent position.

First among these were sharp fourth-quarter price reductions of 38 to 40% on all of SynOptics's Ethernet products. Michael Szabados, director of systems marketing, says the price cuts helped stave off price-driven competitors, such as Chipcom Corp. and David Systems Inc. Also, to reach the growing low-end Ethernet market, SynOptics introduced a 10BaseT Ethernet hub designed for small, stand-alone networks of 12 to 100 nodes, priced at under $200 per node. The result was an immediate uptick in sales; fourth-quarter revenue exceeded third-quarter results by 7%.

Next, SynOptics groomed its overcrowded U.S. distribution channels. According to Doug Gold, network industry analyst for the Framingham, Mass.-based market research firm International Data Corp., the company simply had too many partners. "It got to the point where they were stepping on their own toes," Gold says. "Distributors and VARs were competing for the same deals." At the same time, SynOptics beefed up its thinner European channels through the addition of several resellers and distributors, including Anixter in Britain and Ing C. Olivetti & Co. SpA throughout Europe. International sales more than doubled to $74 million in 1991.

Finally, the company maintained its long-standing commitment to new-product development. More than 42% of 1991 revenue stemmed from products less than 12 months old; research and development expenditures for the year exceeded $30 million, more than 12% of revenue. Several of SynOptics's most important new products, however, originated from strategic alliances. A joint development project with IBM resulted in a new industry standard for 16-megabit-per-second Token Ring connections over unshielded twisted pair wiring. And a partnership with Sun Microsystems Inc. produced LattisNet Manager For UNIX, a suite of integrated network management modules built on Sun's SunNet Manager.

Despite this recent spate of savvy management decisions, concerns over SynOptics's marketing strategy still linger. As smart hubs become more of a commodity, crucial resellers could defect to lower-priced competitors. And although technological innovations could sustain customer interest for a time, without an internal systems integration capability like Cabletron's to insulate it from cutthroat hardware competition, SynOptics could risk becoming the Compaq of the smart-hub industry.—*Don Marks*

IS Revenue 89 $238.0 Million
NORTH AMERICA

CONCURRENT COMPUTER CORP.
2 Crescent Place
Oceanport, NJ 07757
(908)-758-7000

Until last November, it looked as though Concurrent Computer Corp. would drown under its weighty burden of debt. At the time, three major bondholders were petitioning the highly leveraged real-time systems maker to seek protection under Chapter 11 of the bankruptcy code. Revenues sank 19.6% to $238 million, with a consequent $17.6 million operating loss.

But, by instituting Draconian expense controls and through ingenious financial maneuverings, the company managed to avoid Chapter 11. In late November, chairman and chief executive officer Denis R. Brown pulled off a recapitalization, which reduced junk bond debt by $61.1 million and gave 70% of Concurrent's equity to bondholders. This resulted in a one-time gain that pushed net earnings to $14.4 million, compared with a $60 million loss the year before.

Having pulled the company through two tough years of restructuring, during which Concurrent laid off 1,000 people, Brown now says he "feels great." The typically upbeat turnaround specialist says, "I feel that the prospects of the company are considerably improved over what they were."

But senior manager of investor relations Barbara Pistilli says Concurrent is not yet in a position to forecast short-term performance. "The highly competitive environment and poor economic conditions make it very hard to predict earnings at the current level of revenue."

Contributing to the difficulty in making accurate forecasts is Concurrent's development of UNIX-based systems, which will begin to replace its current proprietary line sometime this year, says Brown. Those new products will bring lower profit margins, which Concurrent can ill afford.

It's possible that Concurrent could make up the difference by selling a higher volume of products to customers who are demanding standard systems, however.

After a lean 1991 during which the company made only one major product announcement—the Series 7000, a Motorola 68040-based computer line—the company, which spends about 10% of revenues on research and development, now expects to steadily roll out systems and software over the next few years, says Brown. "We have plans to release new products like normal companies do," he says. "The real message is: We're now a normal company."

But Concurrent still faces challenges. Brown is trying to build confidence in the firm's finances by consistently paying debt two months ahead of due dates, and he says the firm's cash level is higher than it's been in a long time. The company even managed a small operating profit of $2.3 million in the fourth quarter of 1991. His recent promotion of executive vice president John T. Stihl to the president and chief operating officer spot reflects Brown's feeling that, now over the financial crisis, he can focus on strategic marketing and partnering issues. "We are now getting our organization in place for the long haul," he says. "Before, we basically divided up all the problems."

—*Elaine L. Appleton*

IS Revenue 90 $232.8 Million
NORTH AMERICA

REYNOLDS AND REYNOLDS CO.
115 South Ludlow Street
Dayton, OH 45402
(513)-443-2000

It was a good news bad news year for Reynolds and Reynolds Co. in 1991. After struggling to maintain essentially flat revenue in 1990's stagnant market, revenues from its IS division dropped a further 8.4% to $232.8 million last year.

And total revenue for the firm, which apart from vertical market computer systems also supplies business forms, was down 2.6% to $592 million.

But a combination of stringent cost controls, the sale of unprofitable business in Australia and reduced expenses as the company fully amortized the cost of product development for its medical software resulted in an impressive 12.8% gain in net earnings for the IS operation to $25.6 million.

The company is looking for IS revenue recovery partly by focusing on its core business of providing information systems and services to U.S. auto dealers. The major obstacle is the overall sluggish economy, which continued to hold down new car sales.

Reynolds is also sticking with a strategy of expanding into the back shops at auto dealerships. Although the market is still shrinking, company officials claim the approach has helped Reynolds gain a better share of what remains.

Last year, the company introduced a new version of its ERA dealership system built on NCR Corp.'s Tower machines. The system incorporated two industry standards—Bell & Howell Co.'s auto parts catalog based on compact disc, read only memory (CD-ROM) and Mitchell International's bar code system for automated body repair estimates.

This year, Reynolds introduced version 7.0 of ERA at the 1992 National Auto Dealers Association show. The new version integrates the body shop with the in-house system, linking the parts inventory with the business office and other areas of dealership.

General Motors Corp., Nissan Motor Co. Ltd. and Volvo AB have all recommended Reynolds systems to their dealers. Such endorsements gave a boost to industry trends that were already helping to drive growth in Reynolds's IS division. Sales were also strengthened by GM's announcement that it would discontinue the use of paper catalogs beginning in 1994.

Reynolds focused exclusively on the auto industry before 1987, when it purchased National Medical Computer Services, which markets a physicians management system for hospitals. Although the San Diego-based subsidiary has yet to contribute significantly to Reynolds's revenues, it's no longer a drain on resources.

Reynolds officials reported that in 1991, NMC Services turned the corner and began generating a profit, largely on the strength of a new system aimed at expanding the subsidiary's share of the IS market for group practices.

—*Chris Sivula*

IS Revenue 91 $230.9 Million
NORTH AMERICA

ZEOS INTERNATIONAL LTD.
530 Fifth Avenue, Northwest
St. Paul, MN 55112
(612)-633-8033

"Upgradable" doesn't just describe Zeos International Ltd.'s line of desktop PCs—it describes the company. A whopping 81.7% boost in revenue to $230.9 million and a meteoric 145% net earnings growth to $10.3 million blasted the direct market PC source into the top 100 North American IT suppliers.

Introduced in July, the upgradables were important, says Zeos chairman and chief executive officer Gregory E. Herrick. But he adds that the hot product of 1991 was really the 6.6-pound ZEOS Notebook 386, accounting at times for more than 50% of sales, and driving the company last March to announce it would double its manufacturing capacity.

Ironically, that's the very product the company is expected to replace this summer with an all-Zeos-built design. (The original was made by Sanyo Electric Co. and assembled by Zeos.) Herrick says rolling its own notebook will enable Zeos to cut costs and add unique features that will differentiate a Zeos notebook in a cookie-cutter market.

That sounds good to Ruth Sadler, administrative assistant at Pfizer Specialty Minerals Group in Easton, Pa., who purchased two dozen of the Sanyo-based notebooks from Zeos. While those have served well, Sadler expects a vendor that can build its own hardware to be more responsive to customer-requested design changes.

Help with the redesign will come from PC Tech Inc., acquired by Zeos early this year. PC Tech also helped design Zeos's upgradable line. Some cash for research and development came by way of Zeos's 1991 public offering of 2.4 million shares of common stock, which also may help fund the company's expected 1992 European expansion. Herrick says ad copy and pricing are translated and ready to go in France, Germany and the United Kingdom, and that an as-yet-unnamed ex-Dell Computer Corp. employee has been tapped to spearhead European operations.

Steven L. Eskenazi, analyst in New York City for the market research firm Alex. Brown & Sons Inc. of Baltimore, says Zeos should find fertile sales territory in Europe, where it will face less direct competition. Domestically, Zeos's main challenge is execution, Eskenazi says, pointing out that Zeos's phenomenal 1991 notebook sales flattened in early 1992 because competitors like Dell Computer Corp. rolled out their home-built notebooks first.

Of course, another way Zeos might edge out Dell and Gateway 2000 Inc. could be to move beyond its direct-marketing roots and hit retail shelves—a possibility tipped by the 1991 opening of a Zeos factory outlet store in St. Paul. Herrick says there's no plan to tap retail channels—then again, he won't rule it out. If the store "were wildly successful," says Herrick, "I think we'd be remiss if we didn't open another one."

—Ned Snell

IS Revenue 92 $229.7 Million
NORTH AMERICA

ADOBE SYSTEMS INC.
1585 Charleston Road
Mountain View, CA 94043
(415)-961-4400

Adobe Systems Inc. could do no wrong in 1991. The typeface technology company had a 36.1% revenue gain to $229.7 million for 1991, and net income rose 28.7% to $51.6 million.

The company's bottom line got a boost from new licensing agreements with Apple Computer Inc., Digital Equipment Corp. and Lotus Development Corp. Apple and Digital will resell Adobe products to their customers; Lotus has incorporated Adobe font technology into the Windows versions of its 1-2-3 spreadsheet, Ami word processor and Macintosh-based products.

Adobe's horizons are not cloud free, however. The company's Adobe Type Manager (ATM) and add-on fonts are facing a tough challenge in the add-on typeface market from Microsoft Corp.'s TrueType technology, embedded in Windows version 3.1. Adobe's fonts are not compatible with the TrueType font management software. For Adobe to continue strong sales of ATM, it will have to convince users to discard TrueType fonts included with Windows and switch to ATM—not an enviable task.

But Adobe chairman and chief executive officer John Warnock says he isn't worried. He cites Adobe's revenue figures, saying only 4% is derived from retail sales of type fonts to PC users.

The nine-year-old company has also traditionally relied on royalties from the licensing of Adobe's PostScript page description language to printer manufacturers. But as the price of printers incorporating the technology has dropped, so have Adobe's royalties.

With that in mind, the company is hard at work on Carousel, which will offer document-linking and compound document-building features similar to those provided by the Object Linking and Embedding (OLE) technology found in Windows. But, unlike Microsoft's current version of OLE, Carousel will allow documents to be linked across desktop operating systems and platforms.

Warnock says Carousel will ship by the end of 1992 or early in 1993. The company says it has lined up several technology partners, including Apple, to support the Carousel technology.

By far, the strongest revenue growth area for Adobe has been its applications business, up 64% in 1991. Growth was driven by sales of Adobe Illustrator design and illustration software, which began shipping in a Windows version this spring, and by Adobe Photoshop, a scanned photo enhancement package for the Macintosh.

Adobe entered the multimedia business in 1991, when it purchased the rights to a new product, dubbed Adobe Premiere, from SuperMac Technology. Premiere works with Apple's QuickTime media integration technology on the Mac to let users create and assemble full-motion digital video.

—Mike Ricciuti

IS Revenue 93 $228.9 Million
NORTH AMERICA

STERLING SOFTWARE INC.
Suite 1100
8080 North Central Expressway
Dallas, TX 75206
(214)-891-8600

Sterling Software Inc. showed respectable revenue growth last year of 10.6% to $228.9 million. Net earnings grew 5.6% to $13.1 million. The company, which has acquired 13 other companies since going public in 1983, acquired two more information services companies last year: Knowledge Systems Concepts, which became part of Sterling's Federal Systems Group; and the Redinet Services Division of Control Data Corp., a provider of electronic data interchange services. That's now part of Sterling's EDI Group.

The company is actually made up of three major product groups. The Systems Software Group generates about 40% of revenue; that's up from 37% in 1990. The Federal Systems Group accounts for 37% of revenue, down from 43%. The EDI Group generates about 20% of revenue, up from 12% in 1990, its first year of operation as an independent group.

The company continued last year to develop the three-part software development strategy of its Systems Software Group. The idea is to stay with its 90,000 customers in their move to advanced-computing systems and client/server development and support. As Sterling president and chief executive officer Sterling Williams puts it: "Our role is clear—to lead the transition from the unconnected information systems of the 1980s to the enterprisewide computing systems of the '90s, and beyond."

The elements of its three-part strategy, announced in 1990, include the company's Corporate Storage Management Initiative (CSMI) in the Software Group's storage management. division; the Corporate Applications Management Initiative (CAMI) in its applications development and information management division; and the Corporate Data Communications Initiative (CDCI) in its data communications division.

As part of CSMI, the company continued to work last year on its Project Eagle to develop system managed storage products for distributed systems. Sterling also acquired a software development facility located in Tefen, Israel, and announced its GALIL local area network-based storage management product plans. As part of CAMI, Sterling merged its Answer Systems Division into its Dylakor Division, bringing together its applications development and information products under a single development and marketing team. And as part of its CDCI, the company released a new product, Supertracs Software Protocol Converter for OS/2.

With its large user base and some $135 million in order backlogs for software and services, Sterling's future looks relatively secure. Wall Street appeared to agree with that prognosis last year; Standard & Poor's Corp. raised its rating of Sterling's subordinated debt from Single-B-Minus to Single-B as the year drew to a close, and gave the company an implied senior rating of Single-B-Plus.

—*J. William Semich*

IS Revenue $221.6 Million

94

NORTH AMERICA

PYRAMID TECHNOLOGY CORP.

3860 North First Street
San Jose, CA 95134
(415)-965-7200

Chairman and chief executive officer Richard H. Lussier highlights three factors that help to explain Pyramid Technology Corp.'s disappointing 1991 financial results. First, the recession led many customers to postpone purchases of Pyramid's multiuser UNIX servers.

Second, says Lussier, many customers interested in UNIX have become confused about whether to go with networks of small workstations; with large, centralized hosts; or with intermediate servers. That's cut growth overall in the UNIX multiuser market, Lussier explains, and hurt Pyramid.

And third, competition has picked up as established vendors such as Data General Corp., Hewlett-Packard Co. and Sun Microsystems Inc. have introduced large servers to compete with Pyramid's.

Consequently, Pyramid saw its results gradually deteriorate as 1991 progressed. After more than doubling earnings to $18.4 million in 1990, the company ended up reporting an $11.1 million loss for 1991, thanks largely to a disastrous fourth quarter in which Pyramid lost $18.5 million. Pyramid's revenues for the year were up only 10.6% to $221.6 million after vaulting 75% the previous year.

Lussier might have added a fourth factor in explaining Pyramid's troubles, particularly late in 1991 and early in 1992. That would be Pyramid's strategy of relying heavily on original equipment manufacturers to help sell and distribute its products. Pyramid was relying especially on AT&T as its primary OEM customer in the U.S. and received $61 million in revenue from AT&T in 1991.

But AT&T's acquisition last year of NCR Corp. dealt a blow to Pyramid's OEM business. Pyramid's revenues generated from AT&T began to drop sharply in late 1991. In the first quarter of 1992, AT&T contributed only $3 million to Pyramid's revenue line.

Lussier, however, says he plans to continue pursuing his strategy of obtaining about 50% of Pyramid's revenues from OEM customers. He's currently searching for another large U.S. OEM customer. And, in 1991, he signed a new Japanese partner, Kobelco, a subsidiary of Kobe Steel Ltd.

The recession also complicated Pyramid's efforts to pull off a major product transition in 1991. The company introduced and began shipping its S series of reduced instruction set computing UNIX servers, based on the R3000 microprocessor from Mips Computer Systems Inc. By the first quarter of 1991, however, only about 33% of Pyramid's revenues were coming from S series products. That was somewhat less than Lussier had hoped for.

Pyramid's 1992 results will be heavily dependent on some additional products that are in the works and a major government contract. Later this year, Pyramid plans to ship a 40 to 45% price/performance upgrade of its S series. Pyramid also hopes it can cash in on the major contract it won in July 1991 to supply the U.S. Treasury Department with 3,200 server systems over a five-year period. The contract, which Pyramid won in cooperation with AT&T, has been held up by challenges from IBM and Lockheed Corp.

If those measures don't help turn Pyramid around in 1992, Lussier says, some additional restructuring will be in order. Specifically, Lussier says he will consider whether to replace costly direct sales organizations with distributors or to withdraw from some markets altogether.—*Jeff Moad*

IS Revenue $220.6 Million

95

NORTH AMERICA

NATIONAL DATA CORP.

1 National Data Plaza
Atlanta, GA 30329
(404)-728-2000

In a move that was long overdue, National Data Corp. finally began to clean house in 1991, after years of inactive management, few new products and services, and some erosion of market share.

But housecleaning never comes cheap. For calendar year 1991, the company dropped 9.8% in revenues to $220.6 million, with a net loss of $14.6 million.

Compounding the company's problems has been the slump in the financial services industry, National Data's major market.

The result? Almost all of its top and middle managers were replaced. Former Unisys Corp. executive O.G. Greene was brought in as president and chief executive officer in mid-1991. He began refocusing the company as soon as he arrived and made a number of structural changes. In May 1992, however, the board elected Robert A. Yellowlees as chairman and CEO, and Greene resigned.

Under Greene, National Data released what he says is the first new cash management product in almost five years—Global Exchange, a type of electronic data interchange (EDI) service that allows companies to deal with Treasury-reporting functions on a worldwide basis. According to Greene, the network on which this service is based will eventually be broadened into a platform for all of National Data's financial services.

"The company had not taken advantage of its technical base to add new customers. We have stopped the deterioration and are starting to deliver new products," Greene explained. Greene also consolidated National Data's credit card and cash management divisions into one group, representing about two-thirds of the company's business. The move allows National Data to market all of its financial services through one sales force, using one administrative group and one development group. He is in the process of doing the same with its health care industry services, which represent about 17% of the company.

Two point-of-sale products were also unveiled in 1991 and before his departure, Greene had predicted there would be more new products this year.

National Data also expanded its pharmaceutical claims-processing business in 1991, tripling the volume of claims processed each month from the level it was handling a year ago. It's also moving to process claims for dentists in the Southwest and Midwest. In addition, the company has signed a contract with Blue Cross & Blue Shield of Canada to process all of its dental claims, Greene says.

According to analysts, the problems aren't over at National Data, but Greene made a good start in cutting costs and bringing in new business. The company appears to have stabilized, but the next year under Yellowlees will be telling.

"There are bound to be some false starts in any turnaround," suggests Stephen McClellan, an analyst with New York City-based Merrill Lynch & Co. Inc. "The company has lost a lot of ground, and is playing catch-up with a moving target." —*Leila Davis*

IS Revenue **$213.3 Million**

96

NORTH AMERICA

SEQUENT COMPUTER SYSTEMS INC.
15450 Southwest Koll Parkway
Beaverton, OR 97006
(503)-626-5700

Rarely in recent years has a systems vendor reversed a precipitous financial decline in as short a time as Sequent Computer Systems Inc. has. The runaway growth of the symmetric-multiprocessing systems vendor stopped short last year. Revenue declined 14.3% to $213.3 million, and the company lost $48.7 million, down sharply from net earnings of $18.8 million in 1990. The loss included restructuring charges of $22.2 million, which Sequent took mainly to lay off about 450 employees, about 50 of whom have since returned. It was the company's first loss since its founding in 1983.

But all of the decline came in the first three quarters; both revenues and earnings rose in the fourth quarter. The company turned a modest profit in the first quarter of 1992, and financial analysts say prospects look good for the rest of the year.

Some of Sequent's problems mirrored those of other large-systems vendors. Due to the recession, says investor relations manager John Eldridge, customers deferred or canceled large-system purchases, worth $500,000 or more; the company instead focused on selling systems costing less than $100,000.

But not all of its problems could be blamed on the economy. In early 1991, cofounder and president Scott Gibson said that the company had relied too much on sales from original equipment manufacturers (OEMs) like Unisys Corp. At midyear, reports Montgomery Securities in San Francisco, OEM business accounted for only 10% of Sequent's sales, down from 30% the year before. Although Unisys's OEM business picked up early this year, and the companies extended their relationship for another two years, Sequent will continue to shift its focus to direct sales. "OEM accounts are not an integral part of our business plan," says Eldridge.

The burgeoning sales force has more products to sell this year. Sequent's parallel version of Novell Inc.'s NetWare operating system, which shipped late last year, shows promise. In the fourth quarter, the product, which links PC LANs to Sequent's Symmetry database servers, was a "very healthy contributor to our resurgence," says Gibson.

Still, despite high interest in parallel NetWare and favorable ratings for its newest Symmetry 2000/x50 machines, which employ multiple 80486 chips, scrappy Sequent faces some tussles. Hewlett-Packard Co., in particular, is a formidable competitor, and Sun Microsystems Inc. is planning to join the fray. Sun poses less of a problem, however: "I don't worry much about Sun's success," says Eldridge. "It's very difficult to produce true, symmetric multiprocessing platforms."

—*Elaine L. Appleton*

IS Revenue $207.8 Million

97

NORTH AMERICA

LEGENT CORP.
8615 Westwood Center Drive
Vienna, VA 22182
(703)-734-9494

Legent Corp., like many other vendors in 1991, took a long, hard look down the road and saw that its now-strong mainframe software business will eventually weaken as sales of big iron plummet. Under the direction of president and chief executive officer John Burton, Legent is moving from being a vendor of mainframe systems management software toward becoming an enterprisewide systems management provider.

The strategy seems to be paying off. Legent's revenue rose 15.1% last year to $207.8 million. Net earnings edged up 4.3% to $36.2 million.

"Last year was really a catharsis for us," says Burton. "We began to feel economic pressure at the beginning of the year. That forced us to reevaluate our market position and our strategy for the future." The strategy included reorganizing the company's sales force. It also included buying technology—and the vendors who make it. Legent completed nine mergers and acquisitions in 1991. And it doesn't show any sign of slowing down after a merger with mainframe software and utilities vendor Goal Systems International Inc., which was announced this April.

Burton says that instead of keeping the companies it bought in individual divisions, Legent has organized the whole company into technology and sales areas representing market segments. Those segments include Operations, which handles data center operation products; Systems, for system performance software; App-lications Management, devoted to products for managing, running and building applications; and Networks, which handles network performance and access products. A fifth area, called Enabling Technologies, spans all other areas and provides "building block" technologies used in every Legent product, like graphical user interfaces and communications code.

Although the Goal deal is getting the most notice, Burton says Legent's purchase of Spectrum Concepts Inc., announced in September of 1991, was the "most crucial step in us becoming an enterprisewide systems vendor." Spectrum makes a product, called XCOM, that lets Legent tie together systems management software running on multiple operating systems. "It is becoming increasingly difficult to sell mainframe software unless you can demonstrate how it will work with software on other platforms," Burton says. "And that's what we are doing."

With that in mind, Legent is rewriting some of its older products in C so that they will be portable to multiple operating systems, like UNIX. And in April, Legent signed a joint-marketing deal with Landmark Systems Corp. to sell products that display Legent and Landmark mainframe-based system monitors on a PC under Microsoft Windows.

Future acquisitions are not out of the question, says Burton. "We will have to buy some technology to build our products. But I don't see any more on the level of the Goal consolidation."—*Mike Ricciuti*

IS Revenue $206.6 Million

98

NORTH AMERICA

BOLT BERANEK AND NEWMAN INC.
70 Fawcett Street
Cambridge, MA 02138
(617)-873-2000

In a year when everybody and his brother beefed up parallel processor development, diversified systems and software company Bolt Beranek and Newman Inc. backed off and still squeaked into the North American Top 100. BBN's 1991 revenue of $206.6 million from IS products and services (out of about $262.9 million total corporate revenue) is only a couple of million better than 1990's figure. But that 1.1% gain is a small recovery relative to the previous year's 13.5% drop, when revenues plummeted $30 million. And 1991's $6.6 million in net earnings is a far cry from the previous year's $34.8 million of red ink.

Last summer, the company suspended research and development on the successor (code-named "Coral") to its TC2000 parallel-processing system while promising to continue to support TC2000 customers. The rumored effort to form a development partnership with Cray Research Inc. fizzled, and chairman and chief executive officer Stephen R. Levy admits the company can't afford to develop Coral without outside support. "We had to concentrate in areas where we already had strong businesses," Levy says.

In such areas, BBN is investing mightily in R&D—12.3% of revenue, about twice what BBN spent in the 1980s, Levy says. Major development is under way in broadband communications, network access devices, technical data analysis software and simulation systems—all aimed at BBN's traditional base of military and industrial/scientific customers.

In 1991, such products reeled in clients like the U.S. Navy's Space and Naval Warfare Systems Command, which awarded a BBN-IBM team the contract to build a major signal and information-processing system. Late last year, Mead Data Central tapped BBN to build a wide area access network for Mead's LEXIS and NEXIS information services, and the year was capped when *Digital Review* readers voted BBN's RS/1 data analysis software "Best Software for Data Visualization—Scientific and Technical." No doubt these events are part of the reason BBN's roster of products slated to be introduced this year includes a new family of desktop software for data analysis and an integrated access device for communications networks. *—Ned Snell*

IS Revenue **99** $202.3 Million
NORTH AMERICA

INFORMATION BUILDERS INC.
1250 Broadway
New York, NY 10001
(212)-736-4433

Slowly, but surely—that's the way Information Builders Inc. is making its way up through the ranks of the North American DATAMATION 100. Making its debut last year in the 100th position, the 17-year-old software company is on the charts at No. 99 this year for its 1991 performance. While this increase is not exactly meteoric, that's in part because the company went through a major strategy shift in 1991 with the introduction of a new corporate division devoted to a new product, Enterprise Data Access/Structured Query Language (EDA/SQL).

Since the September 1991 introduction of EDA/SQL, more than 30 companies (including Apple Computer Inc. and IBM) have announced support for the product, which aims at universal, desktop database access. IBI also added alliances with Digital Equipment Corp., Lotus Development Corp. and Pilot Executive Software to its already established list of business partners.

Still, the growth has not been as steady as the company founder and president Gerald D. Cohen might have wished. IS revenues were up a modest 5.9% to $202.3 million in 1991. Cohen admits that the increase was "a little disappointing," when you consider that the growth rate was 18.8% in 1990. The privately held company does not divulge net earnings figures.

The company had expected the pace to continue at about the same rate in 1991; Cohen attributes the falloff to the big ramp-up for the new product, as well as to a dismal performance in the European market, which makes up about one-quarter of IBI's revenues.

Meanwhile, sales of IBI's mainstay product, the fourth-generation language Focus, have been proceeding apace. Focus's user base now stands at about 1 million, up 25% from 1990's base. And IBI can hardly be accused of neglecting its other offerings—last year, it introduced release 6.0 of PC/Focus; HiperFocus, a high-performance version of Focus for MVS/ESA; and Level5 Object for DEC VAX/VMS, an object-oriented tool that evolved from IBI's Level5 expert system shell.

The company will try to continue to rack up as many strategic alliances as possible to further Cohen's vision of EDA/SQL as a universal database server. "Every machine that has data on it should be an EDA server," he says. While it remains to be seen how EDA/SQL will fare—it was introduced too late in the year to have a serious bottom-line impact in 1991—IBI is attempting to keep its bases covered for the foreseeable future.

—Lauren Gibbons Paul

IS Revenue **100** $200.5 Million
NORTH AMERICA

GENICOM CORP.
1 Genicom Drive
Waynesboro, VA 22980
(703)-949-1000

"Brave" may be an apt description of printer, sealed relay and services vendor Genicom Corp., which in 1991 posted a $13 million net loss. The $217.0 million revenue total ($200.5 million from IS products and services) marks Genicom's fifth consecutive year of declining revenues, down 14.9% from 1990's $255 million and down 28.1% from $302 million of 1987. It's a trend president and chief executive officer Paul T. Winn chalks up to "recessionary pressures, increasing competition and rapid changes in the global marketplace."

So what did Genicom do in early 1992? It plunged into one of the most cutthroat markets around, adding a 17-page-per-minute laser printer to its bread-and-butter line of high-speed impact printers—despite havin bombed with its previous laser effort, the 6000 series, which bit the dust in 1990.

Genicom's timing in joining the laser wars when in decline can be questioned, but not its strategy. In its 1991 purchase of Rastek Corp., Genicom acquired an infusion of raster image and page description technology, an important weapon for standing out in the laser market. The first model in the upcoming series, the 7170 Network Laser, is positioned to go head-to-head against laser legend Hewlett-Packard Co.'s LaserJet IIIsi, but boasts a few added features and a lower list price.

While the company hopes sales of its new laser printers will eventually help it recover its core printer revenues (down $30 million in 1991), its maintenance services, consumables and relay businesses began to grow late in 1991 and may help sustain the company for the near term.

In the meantime, Genicom is taking hard steps to hang on. As part of a three-year recovery plan mapped out in 1990, the company reduced its long-term debt by $21.7 million in 1991 and streamlined manufacturing by closing one plant and implementing an advanced manufacturing computer system.

Genicom's plan may pay off. While down from 1990's first-quarter income, Genicom's revenue in the first quarter of 1992 is at least higher than it was in the last quarter of 1991. And that's the second consecutive quarterly increase. The company has chosen a tough course. But considering the last five years, Genicom has nothing to lose and all to gain by taking a risk.

—Ned Snell

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	Page	Circle
Andersen Consulting	97	32
AST Research Inc.	C3	2
Attachmate	66	23
Bantam Books	143	50
BMC Software Inc.	23	9
BRS Software	161	54
CIE America	112	39
Compaq Computers Corp.	71-73	25, 26
Computer Associates	8, 50-51	8, 16
Computer Vectors, Inc.**	165	57
Cooperative Solutions	60	20
DCA	21	6
Digital Equipment Corp.	6-7, 54, 94, 115	—
Embassy Suites	140	49
Empress	98	33
Encore	59	19
Exide Electronics	53	17
Fair Isaacs	132	45
Genicom	131	44
Grafpoint	113	1
IBM Corp.	18-19, 76-77, 116-117	—
Information Builders	128	43
Information Resources	65	22
Integris	C4	3, 4
Intel	56-57	18
International Power Machines	157	52
Intersolv	135	46
LEGENT CORP.	10-11	7
Litton Computer Services**	165	55
Minolta Corporation	139	48
Multiverse Communications***	165	56
Must Software Intl.	144	51
Natural Language	136	47
NCR Corp.	62-63	21
NEC	68-69	24
Network Systems	40-41	13
Okidata	47	14
Oracle Corp.	2, 4	—
Platinum Technology	78-79	28
Popkin Software	74	27
Progress Software	107	36
Qualitas	127	42
Quarterdeck	1	5
SAP America, Inc.	93	31
SAS Institute Inc.	C2	—
Sequoia	124	41
Startek	108	37
Sterling Software	123	40
Sun Microsystems, Inc.	28-29	11
Systems Center	111	38
Telxon Corp.	102	35
Toshiba America Information	32-33	12
Unisys Corp.	24-25	10
UNIV Expo '92	158	53
Ventura Software	88-89	30
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Xerox Corp.	48	15
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Acer	200
Adobe	201
ADP	202
Amdahl	203
American Express	204
American Management	205
Andersen Consulting	206
Apple	207
ASK Computer	208
AST Research	209
AT&T	210
Autodesk	211
Bell Atlantic	212
Boeing	213
Bolt Beranek & Newman	214
Borland	215
British Telecom	216
Cabletron	217
Cadence	218
Canon	219
Cap Gemini	220
C. Itoh	221
Commodore	222
Compaq	223
Comparex	224
CompuAdd	225
Computer Associates	226
Computer Task Group	227
Concurrent	228
Conner Peripherals	229
Control Data	230
Coopers & Lybrand	231
Cray	232
CSC	233
CSK	234
D&B Software	235
Data General	236
Datapoint	237
Dell	238
Diebold	239
Digital	240
EDS	241
Ernst & Young	242
Everex	243
Finsiel	244
FiServ	245
Fujitsu	246
Gateway 2000	247
General Electric	248
Genicom	249
Gerber Scientific	250
Getronics	251
Groupe Bull	252
Hewlett-Packard	253
Hitachi	254
IBM	255
ICL	256
Information Builders	257
Intec	258
Intel	259
Intergraph	260
Kodak	261
Legent	262
Lockheed	263
Lotus	264
MAI Systems	265
Martin Marietta	266
Matsushita	267
Maxtor	268
Memorex Telex	269
Mentor	270
Micropolis	271
Microsoft	272
Mitac	273
Mitsubishi	274
Motorola	275
National Data	276
NEC	277
Nihon Unisys	278
Northern Telecom	279
Nomura	280
Novell	281
NTT	282
NYNEX	283
Oki	284
Olivetti	285
Oracle	286
Packard Bell	287
PRC	288
Policy Management	289
Price Waterhouse	290
Prime	291
Pyramid	292
Quantum	293
Racal	294
Reynolds & Reynolds	295
Ricoh	296
SAS Institute	297
Science Applications	298
SD-Scicon	299
Seagate	300
Seiko Epson	301
Sema Group	302
Sequent	303
Shared Medical	304
SHL	305
Siemens Nixdorf	306
Silicon Graphics	307
Sligos	308
Sony	309
Sterling	310
StorageTek	311
Stratus	312
Sun	313
SynOptics	314
Systematics	315
Tandem	316
Tandon	317
Tandy	318
Tatung	319
Tektronix	320
Teradata	321
Texas Instruments	322
3Com	323
3M	324
Toshiba	325
TRW	326
Unisys	327
Wang	328
Western Digital	329
WordPerfect	330
Wyse	331
Xerox	332
Zeos	333

DATAMATION 100 COMPANIES